VERITAS

VERITAS NetBackup™ 5.1 for SAP

System Administrator's Guide

for Windows

Disclaimer

The information contained in this publication is subject to change without notice. VERITAS Software Corporation makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. VERITAS Software Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

VERITAS Legal Notice

VERITAS Software Corporation
350 Ellis Street
Mountain View, CA 94043
USA
Phone 650–527–8000 Fax 650–527–2908
www.veritas.com

Third-Party Copyrights

Contents

Preface

This guide describes how to install, configure and use VERITAS NetBackup SAP Extension for Oracle on a Windows platform. In this guide, VERITAS NetBackup for SAP on Windows Extension for Oracle is referred to as NetBackup for SAP on Windows.

For specific information about the NetBackup Server software, refer to:

◆ *NetBackup System Administrator's Guide for UNIX, Volumes I and II*, if you have a UNIX server,

   or

◆ *NetBackup System Administrator's Guide for Windows, Volumes I and II* if you have a Windows server.

This document is the same as `NetBackup_AdminGuide_SAP_Win.pdf` distributed with the NetBackup for SAP on Windows software.

What Is In This Manual?

This guide is organized as follows:

◆ The Introduction contains an overview of NetBackup for SAP on Windows terminology and a technical overview of the NetBackup for SAP on Windows `backint` interface.

◆ Chapter 2 provides information on the installation of NetBackup and the NetBackup for SAP on Windows software.

◆ The Configuration chapter has instructions for configuring your installation. You will also find troubleshooting and debugging instructions in the this chapter.

◆ Using NetBackup for SAP on Windows provides operating instructions for your installing of NetBackup for SAP on Windows.

◆ The Troubleshooting chapter describes the various Troubleshooting tools available with NetBackup for SAP on Windows.

The manual also contains the following appendices.

◆ Appendix A, "NetBackup for SAP backint Command Line" describes the `backint` command line.

◆ Appendix B, "backint -i in_file Contents" describes the `in_file`.

◆ Appendix C, "backint -o out_file Contents" describes the contents of the `out_file`.

◆ Appendix D, "Environment Variable" describes the environmental variables.

◆ Appendix E, "bp.conf File" describes the `bp.conf` file.

◆ Appendix F, "backint -p par_file or initSID.utl Contents" describes the contents of the `par_file`.

◆ Appendix G describes the method for using NetBackup for SAP to back up SAPDB.

Audience

This guide is intended for the:

◆ Oracle database system administrator responsible for configuring and using the SAP system to back up and restore Oracle databases.

◆ The NetBackup system administrator responsible for configuring NetBackup.

A system administrator is defined as a person with system administrator privileges and responsibilities.

This guide assumes:

- ◆ A basic understanding of system administration.

- ◆ A working understanding of NetBackup client and server software.

- ◆ Familiarity with the information covered in the following NetBackup manuals:

  - ◆ *NetBackup System Administrator's Guide for UNIX, Volumes I and II* or *NetBackup System Administrator's Guide for Windows, Volumes I and II*

  - ◆ *NetBackup Troubleshooting Guide for UNIX and Windows*

  - ◆ A thorough understanding of the SAP environment.

Getting Help

VERITAS offers you a variety of support options.

Accessing the VERITAS Technical Support Web Site

The VERITAS Support Web site allows you to:

- ◆ obtain updated information about NetBackup for SAP, including system requirements, supported platforms, and supported peripherals

- ◆ contact the VERITAS Technical Support staff and post questions to them

- ◆ get the latest patches, upgrades, and utilities

- ◆ view the NetBackup for SAP Frequently Asked Questions (FAQ) page

- ◆ search the knowledge base for answers to technical support questions

- ◆ receive automatic notice of product updates

- ◆ find out about NetBackup for SAP training

- ◆ read current white papers related to NetBackup for SAP

The address for the VERITAS Technical Support Web site follows:

- ◆ http://support.veritas.com

Subscribing to VERITAS Email Notification Service

Subscribe to the VERITAS Email notification service to be informed of software alerts, newly published documentation, Beta programs, and other services.

Go to http://support.veritas.com. Select a product and click "E-mail Notifications" on the right side of the page. Your customer profile ensures you receive the latest VERITAS technical information pertaining to your specific interests.

Accessing VERITAS Telephone Support

Telephone support for NetBackup for SAP is only available with a valid support contract. To contact VERITAS for technical support, dial the appropriate phone number listed on the Technical Support Guide included in the product box and have your product license information ready for quick navigation to the proper support group.

▼ **To locate the telephone support directory on the VERITAS web site**

1. Open http://support.veritas.com in your web browser.

2. Click the **Phone Support** icon. A page that contains VERITAS support numbers from around the world appears.

Accessing VERITAS E-mail Support

▼ **To contact support using E-mail on the VERITAS web site**

1. Open http://support.veritas.com in your web browser.

2. Click the **E-mail Support** icon. A brief electronic form will appear and prompt you to:
   ◆ Select a language of your preference
   ◆ Select a product and a platform
   ◆ Associate your message to an existing technical support case
   ◆ Provide additional contact and product information, and your message

3. Click **Send Message**.

Contacting VERITAS Licensing

For license information call 1-800-634-4747 option 3, fax 1-650-527-0952, or e-mail amercustomercare@veritas.com.

NetBackup for SAP Manuals

The following manuals, along with the online help, are included in the NetBackup for SAP documentation set. For a more detailed listing of NetBackup documents, refer to *NetBackup Release Notes for UNIX and Windows.*

If you have a UNIX server, refer to these documents:

◆ *VERITAS NetBackup System Administrator's Guide for UNIX, Volume I*

NetBackup_AdminGuideI_UNIXServer.pdf

Explains how to configure and manage NetBackup on a UNIX server, including managing storage units, backup policies, catalogs and host properties.

◆ *VERITAS NetBackup System Administrator's Guide for UNIX, Volume II*

NetBackup_AdminGuideII_UNIXServer.pdf

Explains additional NetBackup features such as notify scripts, enhanced authorization and authentication, and role-based security. The guide also discusses using NetBackup with AFS, Intelligent Disaster Recovery (IDR), and the BE Tape Reader.

◆ *NetBackup Media Manager System Administrator's Guide for UNIX*

Explains how to configure and manage the storage devices and media on UNIX NetBackup servers. Media Manager is part of NetBackup.

◆ *VERITAS NetBackup Troubleshooting Guide for UNIX and Windows*

Provides troubleshooting information for UNIX- and Windows-based NetBackup products, including Media Manager.

If you have a Windows server, refer to these documents:

◆ *VERITAS NetBackup System Administrator's Guide for Windows, Volume I*

NetBackup_AdminGuideI_WinServer.pdf

Explains how to configure and manage NetBackup on a Windows server, including managing storage units, backup policies, catalogs and host properties.

◆ *VERITAS NetBackup System Administrator's Guide for Windows, Volume II*

NetBackup_AdminGuideII_WinServer.pdf

Explains additional NetBackup features such as notify scripts, enhanced authorization and authentication, and role-based security. The guide also discusses using NetBackup with AFS, Intelligent Disaster Recovery (IDR), and the BE Tape Reader.

◆ *NetBackup Media Manager System Administrator's Guide for Windows*

Explains how to configure and manage the storage devices and media on Windows NetBackup servers. Media Manager is part of NetBackup.

◆ *VERITAS NetBackup Troubleshooting Guide for UNIX and Windows*

Provides troubleshooting information for UNIX- and Windows-based NetBackup products, including Media Manager.

Other Documentation

For this product, you may also need the following manuals from Oracle Corporation:

◆ *Oracle Enterprise Backup Utility Installation and Configuration Guide*

For this product, you may also need the following manuals from SAP Corporation:

◆ *BC SAP Database Administration: Oracle*

You may also need the following manual from SAP AG:

◆ *BC-BRI BACKINT Interface R/3 System*, Release 3.x and 4.x

Glossary

If you encounter unfamiliar terminology, consult the NetBackup online glossary. The glossary contains terms and definitions for NetBackup and all additional NetBackup options and agents.

The NetBackup online glossary is included in the NetBackup help file.

▼ **To access the NetBackup online glossary**

   1. In the NetBackup Administration Console, click **Help** > **Help Topics**.

   2. Click the **Contents** tab.

   3. Click **Glossary of NetBackup Terms**.

Use the scroll function to navigate through the glossary.

Accessibility Features

NetBackup contains features that make the user interface easier to use by people who are visually impaired and by people who have limited dexterity. Accessibility features include:

◆ Support for assistive technologies such as screen readers and voice input (Windows servers only)

◆ Support for keyboard (mouseless) navigation using accelerator keys and mnemonic keys

For more information, see the *NetBackup System Administrator's Guide for Windows, Volume I* or the *NetBackup System Administrator's Guide for UNIX, Volume I.*

Conventions

The following conventions apply throughout the documentation set.

Product-Specific Conventions

The following term is used in the NetBackup for SAP 5.1 documentation to increase readability while maintaining technical accuracy.

◆ Microsoft Windows, Windows

Terms used to describe a specific product or operating system developed by Microsoft, Inc. Some examples you may encounter in NetBackup documentation are, Windows servers, Windows 2000, Windows Server 2003, Windows clients, Windows platforms, or Windows GUI.

When Windows or Windows servers is used in the documentation, it refers to all of the currently supported Windows operating systems. When a specific Windows product is identified in the documentation, only that particular product is valid in that instance.

For a complete list of Windows operating systems and platforms that NetBackup supports, refer to the *NetBackup Release Notes for UNIX and Windows* or go to the VERITAS support web site at `http://www.support.veritas.com`.

Typographical Conventions

Here are the typographical conventions used throughout the manuals:

Conventions

Convention	Description
GUI Font	Used to depict graphical user interface (GUI) objects, such as fields, listboxes, menu commands, and so on. For example: Enter your password in the **Password** field.
Italics	Used for placeholder text, book titles, new terms, or emphasis. Replace placeholder text with your specific text. For example: Replace *filename* with the name of your file. Do *not* use file names that contain spaces.
	This font is also used to highlight NetBackup server-specific or operating system-specific differences. For example: *This step is only applicable for NetBackup Enterprise Server.*

Conventions (continued)

Convention	Description
Code	Used to show what commands you need to type, to identify pathnames where files are located, and to distinguish system or application text that is displayed to you or that is part of a code example.
Key+Key	Used to show that you must hold down the first key while pressing the second key. For example: Ctrl+S means hold down the Ctrl key while you press S.

You should use the appropriate conventions for your platform. For example, when specifying a path, use backslashes on Microsoft Windows and slashes on UNIX. Significant differences between the platforms are noted in the text.

Tips, notes, and cautions are used to emphasize information. The following samples describe when each is used.

Tip   Used for nice-to-know information, like a shortcut.

Note Used for important information that you should know, but that shouldn't cause any damage to your data or your system if you choose to ignore it.

Caution   Used for information that will prevent a problem. Ignore a caution at your own risk.

Command Usage

The following conventions are frequently used in the synopsis of command usage.

brackets [ ]

The enclosed command line component is optional.

Vertical bar or pipe (|)

Separates optional arguments from which the user can choose. For example, when a command has the following format:

    command arg1|arg2

In this example, the user can use either the *arg1* or *arg2* variable.

Navigating Multiple Menu Levels

When navigating multiple menu levels, a greater-than sign (>) is used to indicate a continued action.

The following example shows how the > is used to condense a series of menu selections into one step:

❖ Select **Start** > **Programs** > **VERITAS NetBackup** > **NetBackup Administration Console**.

The corresponding actions could be described in more steps as follows:

1. Click **Start** in the task bar.

2. Move your cursor to **Programs**.

3. Move your cursor to the right and highlight **VERITAS NetBackup**.

4. Move your cursor to the right. First highlight and then click **NetBackup Administration Console**.

Introduction 1

NetBackup for SAP on Windows integrates the database backup and recovery capabilities of SAP Tools with the backup and recovery management capabilities of NetBackup and its Media Manager.

This chapter introduces NetBackup for SAP on Windows and how it relates to both SAP Tools and NetBackup. The following topics introduce NetBackup for SAP on Windows.

- ◆ Terminology for NetBackup for SAP on Windows
- ◆ Features of NetBackup for SAP on Windows
- ◆ Technical Overview of NetBackup for SAP on Windows

Terminology for NetBackup for SAP on Windows

This section explains important terms that may be new to an SAP for Oracle database administrator or a NetBackup administrator. Refer to the following graphic when reviewing the terminology in this section.
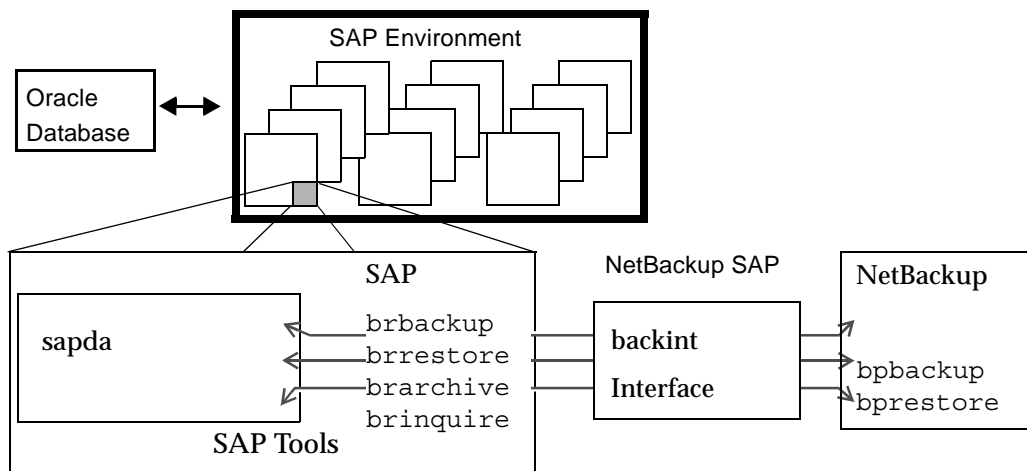
NetBackup

This section describes NetBackup terms as they apply to NetBackup for SAP on Windows.

NetBackup	NetBackup backs up and restores files, directories, raw partitions, and databases on client systems that have SAP databases.
NetBackup policy	NetBackup policies define criteria for backups and restores. These criteria include storage unit and media to use, backup schedules, clients, files to back up, or backup templates or scripts to execute.
NetBackup schedule	NetBackup schedules control NetBackup operations such as: when backups can occur, the type of backup (full, incremental) to perform, and how long NetBackup retains the image (retention level).
Administrator-directed backups	NetBackup administrators are able to perform remote backups of all files, directories, databases, and raw partitions contained on client systems within a client/server network via NetBackup interfaces.
User-directed backups and restores	NetBackup users are able to perform backups of all files, directories, databases, and raw partitions contained on client systems within a client system.
Graphical interfaces	Graphical user interfaces are available for both users and administrators.

Media Manager	The Media Manager provides complete management and tracking of all devices and media used during backups and restores.

For explanations of other NetBackup terms, consult the NetBackup online glossary. For instructions, see the "Glossary" section in the Preface.

SAP Tools

The SAP Environment consists of many modules and applications. One small piece of the SAP Environment is the SAP Tools. SAP Tools provide:

◆ backup and recovery function for an Oracle database,

◆ Oracle administration by communicating with NetBackup through NetBackup for SAP on Windows.

sapdba	sapdba is a menu-driven utility, with menus designed to reflect the user's point of view.
	sapdba provides easy access to brbackup, brarchive, brrestore for database backup/restore. The tool can restore a backup of an entire database or reset the database to a previous state.
brbackup	This command brings database servers on-line or off-line, checks the status of SAP files, and places database tablespaces into BACKUP mode to guarantee their data consistency. brbackup provides on-line or off-line backup of control files, data files, and on-line redo log files. It also keeps a profile and log of each backup.
	brbackup uses the NetBackup software, through NetBackup for SAP on Windows, for:
	◆ SAP datafile backups
	◆ datafile and on-line log backups
	◆ error handling
brarchive	This command archives Oracle off-line redo log files by communicating with the NetBackup for SAP on Windows backint interface. These files are copied by Oracle in its archiving directory. brarchive ensures that duplicates of these logs are available and that original files are not deleted prematurely. This command also keeps a profile and log of each archive.

`brrestore`	This command recovers database data files, control files, and on-line redo log files through the NetBackup for SAP on Windows `backint` interface. `brrestore` ensures that sufficient space is available prior to restoring these files, and removes files that will be overwritten during the recovery. This command also provides a query mode.
SAP script	This is a small script that contains SAP commands such as `brbackup` and `brrestore`.
`backint` Interface	The NetBackup for SAP on Windows `backint` interface communicates instructions from SAP Tools to NetBackup. The `backint` interface is the implementation of the SAP system's *BC-BRI BACKINT Interface* specification.
Backup Function	The backup function of the `backint` interface supports and defines the SAP `brbackup` and `brarchive` tools to NetBackup. `brbackup`/`brarchive` communicate with the `backint` interface through an *in_file* and an *out_file* parameter. The *in_file* parameter includes a list of files to be backed up or archived. The *out_file* parameter reports the status for each file and assigns a Backup ID (BID) to each file. In the event of a partial backup, this function will identify successfully backed up files to the user.
Restore Function	The restore function of the `backint` interface supports and defines the `brrestore` tool to NetBackup. It communicates with the `backint` interface through the *in_file* parameter and *out_file* parameter. The *in_file* parameter includes a list of files to be restored through NetBackup. It also includes the Backup ID (BID) assigned during the backup function. The *out_file* parameter contains the status of the restore for each file. When the NetBackup restore operation is complete, the restore function lists successfully restored files. It will also list BIDs used during the operation.
	The BID is assigned by NetBackup during the backup function. It may identify one or more backup runs, a single file backup or a group of files. During a backup function, the BID is submitted to the *out_file* parameter. During the restore and inquiry functions, the BID can only be set in the *in_file* parameter. For more details, refer to "backint Command Line" on page 75.
	If the BID is not set, the restore function will use the BID of the last backup. As an option, this function can also include a list of directories into which files will be restored. For more details, refer to "backint -i in_file Contents" on page 79.

Inquiry Function   The inquire function supports and defines the sapdba tool to NetBackup. sapdba uses the *in_file* parameter and the *out_file* parameter to collect backup information. The *in_file* parameter contains optional BIDs and filenames.

If only a #NULL is received on the *in_file* parameter, a list of BIDs will be generated to the *out_file* parameter. If a BID is received, a list of files belonging to the BID is generated. If a filename is entered along with the #NULL, a list of BIDs containing that file will be listed.

Features of NetBackup for SAP on Windows

This section describes the NetBackup for SAP on Windows main features.

NetBackup for SAP on Windows main features

Feature	Description
Media and device management	All devices supported by Media Manager are available to NetBackup for SAP on Windows.
Scheduling facilities	NetBackup scheduling facilities on the master server can be used to schedule automatic and unattended SAP backups.
	This also lets you choose the times when these operations can occur. For example, to prevent interference with normal daytime operations, you can schedule your database backups to occur only at night.
Multiplexed backups and restores	NetBackup for SAP on Windows lets you take advantage of NetBackup's multiplexing capabilities. Multiplexing directs multiple data streams to one backup device, thereby reducing the time necessary to complete the operation.

NetBackup for SAP on Windows main features

Feature	Description
Transparent execution of both SAP and regular file system backup and restore operations	All backups and restores are run simultaneously and transparently without any action from the NetBackup administrator.
	A database administrator can run database backup and restore operations through NetBackup or use SAP Tools as if NetBackup were not present.
	An administrator or any other authorized user can use NetBackup to run database backups and restores.
Sharing the same devices and tapes used during other file backups	It is possible to share the same devices and media used for other backups or to give SAP exclusive use of certain devices and media.
Centralized and networked backup operations	From the NetBackup master server, you can schedule database backups or start them manually for any client. The SAP databases can also reside on hosts that are different from the devices on which NetBackup stores the backups.
Graphical user interfaces	NetBackup provides the following graphical user interfaces for client users and administrators:
	◆ Backup, Archive, and Restore user interface
	◆ NetBackup Administration Console for Java
	◆ NetBackup Administration Console for Windows
	A database administrator or NetBackup administrator can start backup or restoreoperations for SAP from the NetBackup graphical user interface on the master server.
Parallel backup and restore operations	NetBackup for SAP on Windows supports the parallel backup and restore capabilities of the SAP Tools. This permits the user to run more than one tape device at a time for a single SAP backup or restore, thereby reducing the time necessary to complete the operation.

Technical Overview of NetBackup for SAP on Windows

The following figure illustrates the components and architecture for SAP and NetBackup.

SAP Applications

Oracle
Database

DB Agent
Operation
Interface

| brbackup | brarchive | brrestore | sapda |

| backint | backint | backint | backint |

Database/File
Backup/Restore

NetBackup for SAP

Robots/Media
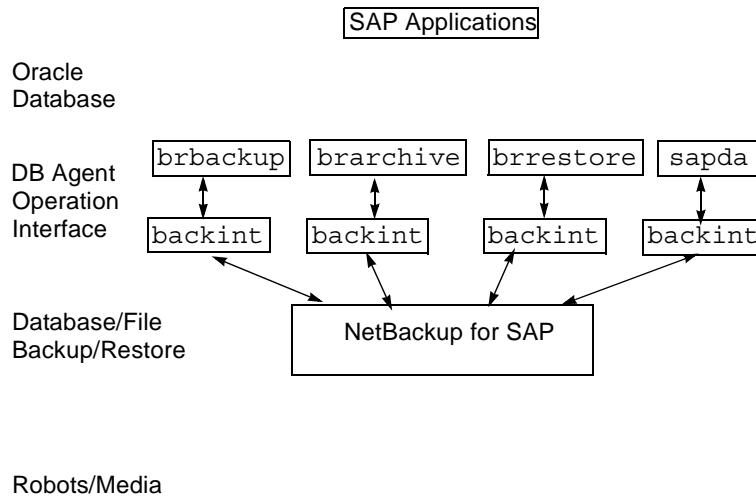
SAP Tools act as database agents, responsible for all database related tasks. These database agents (brbackup, brarchive, and brrestore) communicate with NetBackup through the NetBackup for SAP on Windows backint interface. The sapdba component of SAP Tools also accesses the backup catalog used by NetBackup in order to determine the status of the valid backups.

The example network below shows the major components in a NetBackup for SAP on Windows `backint` interface configuration.

System containing SAP environment and Oracle database

Oracle database

NetBackup for SAP supplies:
- `backint` Interface
- Sample configuration program
- Sample script files

SAP software supplies:
- SAP BR tools:
  `sapda`,
  `brbackup`,
  `brrarchive`
  `brrestore`

Additional required NetBackup software:
- NetBackup Master Server
- NetBackup Client

Network (TCP/IP)

NetBackup master server or remote media server

NetBackup software:
- NetBackup Master Server
- NetBackup Media Server
  (if system is a media server)

Tape or optical storage device

The host with the database must be a NetBackup client and have NetBackup for SAP on Windows, SAP software, and Oracle software installed.

The storage devices are connected to the NetBackup master server. A NetBackup media server can access the storage devices through the master server. Both the master server and the media server must have NetBackup server software installed.

Using NetBackup requires that the administrator create an SAP script with commands for controlling database backup or recovery. For example, an SAP script to back up Oracle databases would have a `brbackup` command. A separate SAP script is needed for each type of operation (see "Creating Scripts" on page 43 for more information on these SAP scripts).

Sequence of Operation

NetBackup users or schedules start database backups or restores by selecting an SAP script. A NetBackup process called `bphdb` starts the SAP script on the client. The SAP application then starts the requested operation on the databases.
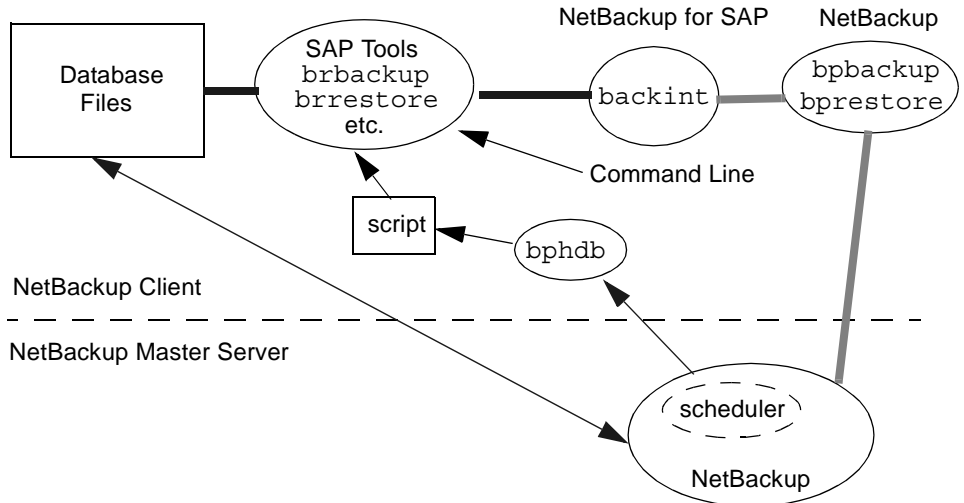
For a backup, `brbackup` calls the NetBackup for SAP on Windows `backint` interface. From this point the operation is similar to a user-directed backup.

A restore works in essentially the same manner except that the NetBackup for SAP on Windows `backint` interface issues a `bprestore` command, causing NetBackup to retrieve the data from secondary storage and send it to the client.

Installation Requirements and Registering a License Key 2

This chapter describes the installation prerequisites for NetBackup for SAP on Windows and how to register a license key for this agent.

NetBackup for SAP on Windows Platform Support

The VERITAS support web site now contains the most current platform support information for NetBackup database agents. You can use the following procedure to locate this information.

▼ **To locate the latest Database Agent information on the VERITAS support web site**

1. Go to the VERITAS support web page: http://www.support.veritas.com.

2. From the Select Product Family list, choose **NetBackup Products**. The Select Product window refreshes showing a list of NetBackup products.

3. Select one of the NetBackup products. The page refreshes and displays a search window with four tabs:
   - Documents
   - Downloads
   - Software Alerts
   - Compatibility

4. Select **5.1** in the **Product Version** drop-down field.

5. Select a Product Platform.

6. Click the **Compatibility** tab. The page will refresh showing documents that contain compatibility information.

7. Click on the title of the document link for NetBackup Database Agent Compatibility List. A document appears that contains a downloadable file that enables you to view the supported database spreadsheet for this release.

Installation Prerequisites

Before enabling NetBackup for SAP on Windows, be sure to complete the following procedures.

- Install NetBackup server software on the server.

  The NetBackup server platform can be any of those that NetBackup supports.

  Refer to the *NetBackup Installation Guide for Windows* or the *NetBackup Installation Guide for UNIX* for details.

◆ Install the NetBackup client software on the client where you will be backing up the databases. This step also installs NetBackup for SAP on Windows.

Registering NetBackup for SAP on Windows

NetBackup for SAP on Windows is installed with the server and client software. To use this agent you need to register a valid license key for it on the master or media server.

▼ **To register a license key**

❖ Open the NetBackup Administration Console on the master or media server and choose **Help** > **License Keys**.

Refer to the *NetBackup System Administrator's Guide for Windows, Volume I* for full details on adding license keys.

Copying the NetBackup for SAP on Windows Binary

SAP requires that all sapdba be located in a predetermined folder. The folder path is as follows:

```
C:\usr\sap\SID\SYS\exe\run
```

where *SID* is a unique name for an Oracle database instance. *SID* is also known as System ID.

The folder should contain the following commands:

◆ `brarchive.exe`

◆ `brbackup.exe`

◆ `brconnect.exe`

◆ `brrestore.exe`

◆ `brtools.exe`

◆ `sapdba.exe`

To follow SAP convention, you must copy `backint.exe` from the NetBackup install folder to SAP's tool folder. For example, if the Oracle instance name is CER, then the following command must be executed:

```
copy install_path\NetBackup\bin\backint.exe
c:\usr\sap\CER\sys\exe\run
```

Configuration 3

Before attempting to configure NetBackup for SAP on Windows, complete the installation procedure as described in the Installation chapter.

The following is the configuration procedure.

1. Configuring Media Using Media and Device Management

2. Setting the Maximum Jobs Per Client Property

3. Configuring a NetBackup Policy

4. Creating Scripts

5. Enabling Database User Authentication

6. Configuring the initSID.utl File

7. Configuring the initSID.sap File

8. Testing NetBackup for SAP on Windows Configuration Settings

To configure NetBackup for SAP on Windows from a Windows NetBackup server, see "Configuration Using the NetBackup Administration Console for Windows" on page 16.

To configure NetBackup for SAP on Windows from a UNIX NetBackup server, see "Configuration Using the NetBackup Administration Console for UNIX" on page 29.

Configuration Using the NetBackup Administration Console for Windows

Although the database agent is installed on the NetBackup client, some configuration procedures are performed using the NetBackup Administration Console on the server.

These procedures include:

◆ Configuring media using Media and Device Management

◆ Setting the **Maximum Jobs per Client** property

◆ Configuring a NetBackup policy

◆ Testing NetBackup for SAP on Windows configuration settings

See the next section for instructions on starting the NetBackup Administration Console.

▼ **To launch the NetBackup Administration Console for Windows**

1. Log on to the server as administrator.

2. Choose **Start** > **Programs** > **VERITAS NetBackup** > **NetBackup Administration Console**.

The NetBackup Administration Console is displayed.

Configuring Media Using Media and Device Management

Use the Media and Device Management (Media Manager) to configure media for a NetBackup for SAP on Windows configuration. Refer to the *NetBackup Media Manager System Administrator's Guide* for more information.

The number of volumes required will depend on the devices used, the size of the SAP databases that you are backing up, and the frequency of backups.

Setting the Maximum Jobs Per Client Property

The **Maximum jobs per client** attribute value is figured with the following formula.

Maximum Jobs per Client = *Number of Drives* x *Number of Policies*

Where:

◆ *Number of Drives* is the number of concurrent bpbackup jobs. These jobs are defined by the drive parameter in the initSID.utl file.

◆ *Number of Policies* is the number of policies that may back up this client at the same time. This number can be greater than one. For example, a client may be in two policies in order to back up two different databases. These backup windows may overlap.

Tip   To avoid any problems, we recommend that you enter a high enough value for the **Maximum jobs per client** property to meet the number of jobs executed by SAP.

▼ **To set the Maximum jobs per client property using the Windows console**

1. In the left pane of the NetBackup Administration Console, expand **Host Properties**.

2. Select **Master Server**.

3. In the right pane, double-click on the server icon.

   The Master Server Properties dialog is displayed.

4. In the Master Server Properties dialog, click **Global Attributes**.
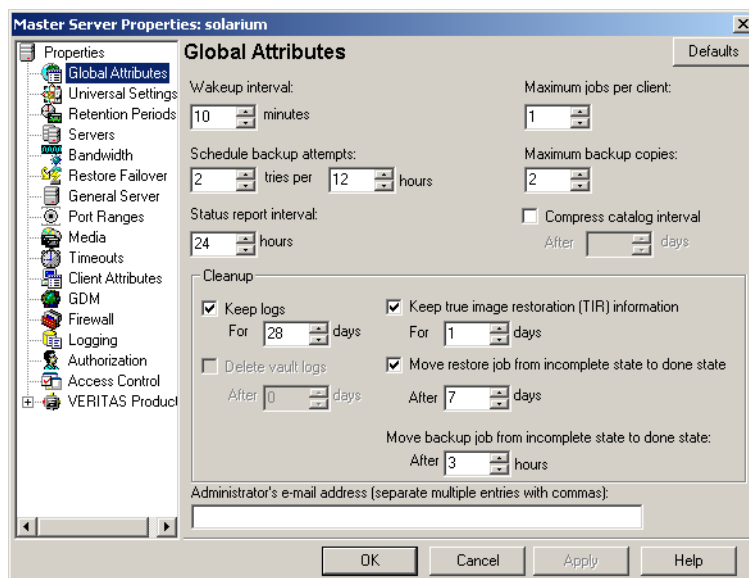
   The default value is 1 for **Maximum jobs per client**.

5. Change the **Maximum jobs per client** value to 99.

If you prefer to enter a lower value, calculate the value equal to the maximum number of backups allowed per client using the formula provided above.

Configuring a NetBackup Policy

A NetBackup policy defines the backup criteria for a specific group of one or more clients. These criteria include:

◆   storage unit and media to use

◆   backup schedules

◆   clients to be backed up

◆   script files to be executed on the clients

To use NetBackup for SAP on Windows, at least one SAP policy with the appropriate schedules needs to be defined. A configuration can have a single policy that includes all clients or there can be many policies, some of which include only one client.

Most requirements for SAP policies are the same as for file system backups. In addition to the attributes described here, there are other attributes for a policy to consider. Refer to the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed configuration instructions and information on all the attributes available.

Adding New Policies

Use this procedure when configuring a policy from a Windows server or from a NetBackup Remote Administration Console host.

▼   **To add a new policy**

Note This policy name can be specified in the `initSID.utl` file on the client.

1. Log on to the server as administrator.

2. Start the NetBackup Administration Console.

3. If your site has more than one master server, choose the one where you want to add the policy.

4. In the left pane, right-click **Policies** and choose **New Policy**.

The Add a New Policy dialog is displayed.
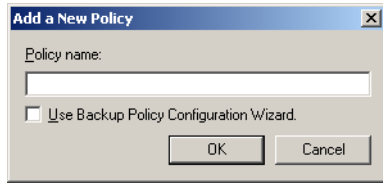
a. In the **Policy name** box, type a unique name for the new policy.

b. Choose whether to use the wizard for configuring the policy. The wizard guides you through most of the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy. You will need to manually add entries to the Backup Selections list after completing the wizard.

◆ To use the wizard, select the **Use Backup Policy Configuration Wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the SAP policy type.

Note The SAP policy type will not appear in the drop-down list unless your server has a license key for NetBackup for SAP on Windows.

◆ If you require more control over the settings than the wizard provides, then do not select the **Use Backup Policy Configuration Wizard** box and proceed to step 5.

5. Click **OK**.

A dialog is displayed in which you can specify the general attributes for the policy.
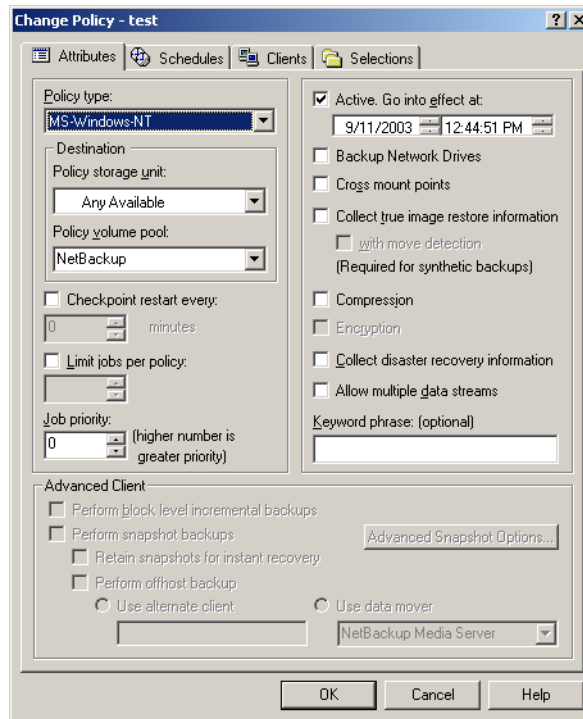
6. From the **Policy Type** box, select the SAP policy type.

7. Complete the entries on the **Attributes** tab as explained in "Description of Attributes."

8. Add other policy information:

   ◆ To add schedules, see "Adding New Schedules."

   ◆ To add clients, see "Adding Clients to a Policy."

   ◆ To add scripts to the Backup Selections list, see "Specifying the List of Backup Selections."

9. Click **OK**. The new policy is created.

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for SAP backups are explained below.

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the policy attributes.

Description of Policy Attributes

Attribute	Description
Policy type	Determines the type of clients that can be in the policy and in some cases the types of backups that can be performed on those clients. To use NetBackup for SAP on Windows, you must have defined at least one SAP policy.
Keyword phrase to associate with the backup	For NetBackup for SAP on Windows, the keyword phrase entry is ignored.

Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

A server-directed, scheduled SAP backup requires an Application Backup schedule, which is created automatically when you create a SAP policy. The Application Backup schedule is used to initiate and manage the backup operation. You also need one or more Automatic Backup schedules, if you plan to have NetBackup perform automatic, scheduled backups.

The following procedures explain how to configure the required schedule types, and how to add new schedules. The procedures start on the Policy dialog. To see the Policy dialog, double-click the policy name in the Policies list of the NetBackup Administration Console.

▼ **To configure an Application Backup schedule**

1. On the Policy dialog, click the **Schedules** tab.

2. Double-click on the schedule named **Default**-**Application**-**Backup**.

   A dialog is displayed.

All SAP database operations are performed through NetBackup for SAP on Windows using an Application Backup schedule. This includes those backups started automatically.

You must configure an Application Backup schedule for each SAP policy you create. If you do not do this, you will not be able to perform a backup. To help satisfy this requirement, an Application Backup schedule named **Default**-**Application**-**Backup** is automatically created when you configure a new SAP policy.

3. Specify the other properties for the schedule as explained in "Schedule Properties."

   The backup window for an Application Backup schedule must encompass the time period during which all NetBackup jobs, scheduled and unscheduled, will occur. This is necessary because the Application Backup schedule starts processes that are required for all NetBackup for SAP on Windows backups, including those started automatically.

   For example, assume that you:

   ◆ expect users to perform NetBackup operations during business hours, 0800 to 1300.

   ◆ configured automatic backups to start between 1800 and 2200.

   The Application Backup schedule must have a start time of 0800 and a duration of 14 hours.

Example Settings for an Application Backup schedule

Type of Backup	Schedule settings	Description	Settings
Application Backup	Retention	The length of time backup images are stored.	2 weeks
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday through Saturday 00:00:01 - 23:59:59

Note The Application Backup schedule name can be specified in the `initSID.utl` file on the client.

Tip Set the time period for the Application Backup schedule for 24 hours per day, seven days per week. This ensures that your NetBackup for SAP on Windows operations are never locked out due to the Application Backup schedule.

▼ **To configure an automatic backup schedule**

1. On the Policy dialog, click the **Schedules** tab.

2. Click **New**.

   A dialog is displayed. The title bar shows the name of the policy to which you are adding the schedules.
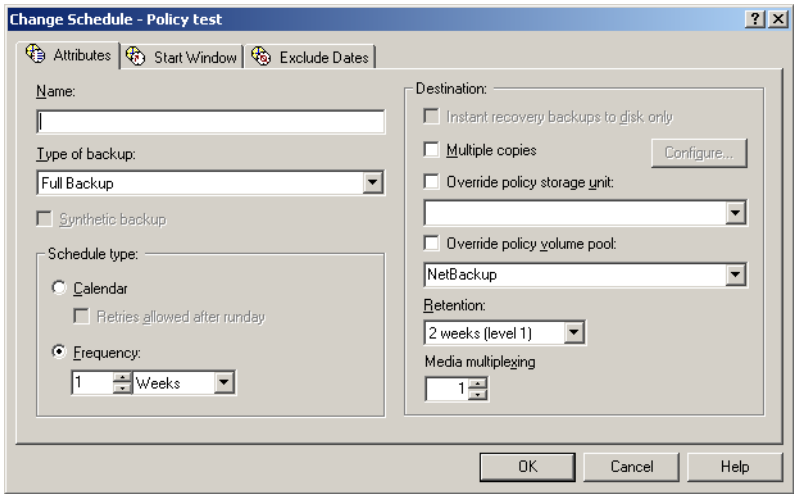
3. Specify a unique name for the schedule.

4. Select the **Type of backup**.

   For information on the types of backups available for this policy, see "Types of Backups."

   Refer to the following table for example settings for an Automatic Backup schedule.

Example Settings for an Automatic Backup Schedule

Type of Backup	Schedule settings	Description	Settings
Automatic Backup	Retention	The length of time to store the record of a backup.	2 weeks
	Frequency	Frequency determines how often a backup should be performed	every week
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday, 18:00:00 - 22:00:00

5. Specify the other properties for the schedule as explained in "Schedule Properties."

6. Click **OK**.

Types of Backups

Description of Backup Types for SAP

Application Backup	The Application Backup schedule enables user-controlled NetBackup operations performed on the client. At least one Application Backup schedule type must be configured for each SAP policy. The Default-Application-Backup schedule is automatically configured as an Application Backup schedule.
Automatic Backup	An Automatic Backup schedule specifies the dates and times when NetBackup will automatically start backups by running the SAP scripts in the order that they appear in the file list. If there is more than one client in the SAP policy, the SAP scripts are executed on each client.

Schedule Properties

Some of the schedule properties have a different meaning for database backups than for a regular file system backup. These properties are explained in the following table.

Other schedule properties vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the schedule properties.

Description of Schedule Properties

Property	Description
Type of backup	Specifies the type of backup that this schedule will control. The selection list shows only the backup types that apply to the policy you are configuring.
	For more information see the following section "Types of Backups."

Description of Schedule Properties (continued)

Property	Description
Frequency	This setting is used only for scheduled backups, and not for user-directed backups. **Frequency** specifies the period of time that will elapse until the next backup operation can begin on this schedule. For example, if the frequency is seven days and a successful backup occurs on Wednesday, the next full backup will not occur until the following Wednesday. Normally, incremental backups will have a shorter frequency than full backups.
Calendar	This setting is used only for scheduled backups, and not for user-directed backups. The **Calendar** option allows you to schedule backup operations based on specific dates, recurring week days, or recurring days of the month.
Retention	**Frequency based scheduling**
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred.
	The NetBackup scheduler compares the latest record to the frequency to determine whether a backup is due. This means that if you set the retention period to expire the record too early, the scheduled backup frequency will be unpredictable. However, if you set the retention period to be longer than necessary, the NetBackup catalog will accumulate unnecessary records. *Therefore, set a retention period that is <u>longer</u> than the frequency setting for the schedule.*
	For example, if the frequency setting is set to one week, set the retention period to be more than one week.
	Calendar based scheduling
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred. However, this setting is not significant for calendar based scheduling.
Multiple copies	If you are licensed for the Inline Tape Copy feature and wish to specify multiple copies for your SAP policy, configure **Multiple copies** on the Application Backup schedule.

Adding Clients to a Policy

The client list is the list of hosts on which your SAP scripts are run during an automatic backup. A NetBackup client must be in at least one policy but can be in more than one.

This procedure starts in the Policy dialog. To see the Policy dialog, double-click the policy name in the Policies list in the NetBackup Administration Console.

Requirements for clients

The following software must be installed on the client:

◆ SAP

◆ NetBackup client or server

◆ the backup or restore script(s)

▼ **To add clients to a policy**

1. In the Policy dialog, click the **Clients** tab.

2. Click **New**.

3. Enter the name of the client you want to add.

   ◆ Type the name into the client list and click **OK**.

     If NetBackup cannot detect the hardware and operating system, a dialog will be displayed so you can specify this information.

     OR

   ◆ Click the **Browse for Computer** button to choose the client from the network:

4. To add another client, repeat step 2 and step 3. If this is the last client, click **OK** to close the dialog.

Specifying the List of Backup Selections

The Backup Selections list in a database policy has a different meaning than for non-database policies. For example, in a Windows-NT policy, the list contains files and folders to be backed up. In a database policy, you specify scripts to be run.

Add scripts only if you are setting up a policy for automatic scheduling. All scripts listed in the Backup Selections list will be executed for the Automatic Backup schedules, as specified under the **Schedules** tab, and manual backups. NetBackup will start backups according to the order that scripts appear in the Backup Selections list.

The following procedure starts in the Policy dialog. To see the Policy dialog, double-click the policy name in the Policies list in the NetBackup Administration Console.

▼ **To add scripts to the Backup Selections list**

1. In the Policy dialog, click the **Backup Selections** tab.

2. Click **New**.

3. Enter the name of the selection.

   ◆ Type the name of the script.

   Be sure to specify the full pathname when listing SAP scripts. For example:

   install_path\NetBackup\dbext\sap\scripts\

   OR

   ◆ Click the **Remote Folder** button.

   The Browse window is displayed. Navigate to the script file and select the file. Click **OK**.

   Be sure that the SAP scripts listed here are installed on each host in the Client list.

4. Click **OK**.

Configuration Using the NetBackup Administration Console for UNIX

Although the database agent is installed on the NetBackup client, some configuration procedures are performed using the NetBackup Administration Console on the server.

These procedures include:

◆ Configuring media using Media and Device Management

◆ Setting the **Maximum Jobs per Client** property

◆ Configuring a NetBackup policy

◆ Testing NetBackup for SAP on Windows configuration settings

See the next section for instructions on starting the NetBackup Administration Console.

▼ **To launch the NetBackup Administration Console for UNIX**

  1. Log onto the UNIX server as root.

  2. Start the NetBackup Administration Console by executing:

  *install_path***/netbackup/bin/jnbSA &**

  The login dialog is displayed.
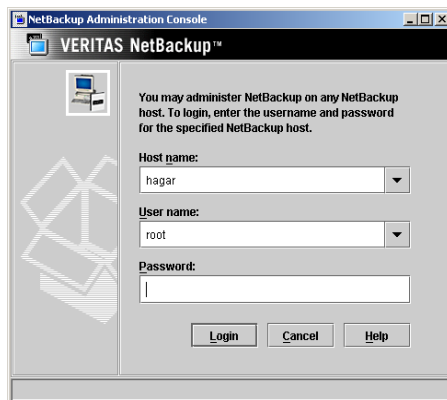
  3. Type the name of the master server where you initially want to manage NetBackup. You can specify any NetBackup master server. Indicate the User and Password.

4. Click **Login**. The NetBackup Administration Console is displayed.

Configuring Media Using Media and Device Management

Use the Media and Device Management (Media Manager) to configure media for a NetBackup for SAP on Windows configuration. Refer to the *NetBackup Media Manager System Administrator's Guide* for more information.

The number of volumes required will depend on the devices used, the size of the SAP databases that you are backing up, and the frequency of backups.

Setting the Maximum Jobs Per Client Property

The **Maximum jobs per client** attribute value is figured with the following formula.

Maximum Jobs per Client = *Number of Drives* x *Number of Policies*

Where:

◆ *Number of Drives* is the number of concurrent bpbackup jobs. These jobs are defined by the drive parameter in the initSID.utl file.

◆ *Number of Policies* is the number of policies that may back up this client at the same time. This number can be greater than one. For example, a client may be in two policies in order to back up two different databases. These backup windows may overlap.

Tip To avoid any problems, we recommend that you enter a high enough value for the **Maximum jobs per client** property to meet the number of jobs executed by SAP.

▼ **To set the Maximum jobs per client property using the NetBackup Administration Console for UNIX**

1. In the left pane of the NetBackup Administration Console, expand **Host Properties**. Select **Master Servers**.

2. In the right pane, double-click on the server icon. Click **Global Attributes**.

    The Master Server Properties dialog is displayed.
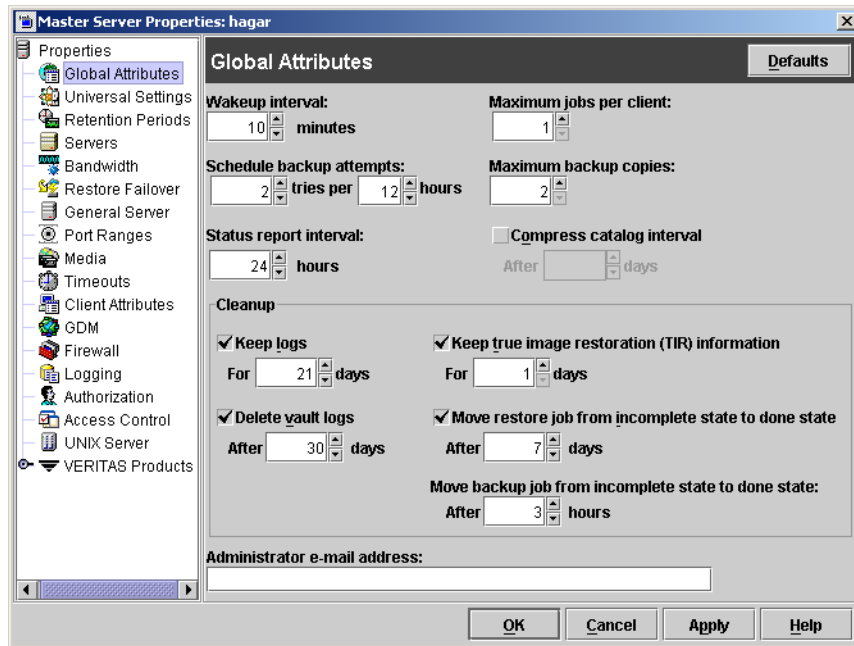
    The default value is 1 for **Maximum jobs per client**.

3. Change the **Maximum jobs per client** value to 99.

If you prefer to enter a lower value, calculate the value equal to the maximum number of backups allowed per client using the formula provided above.

Configuring a NetBackup Policy

A NetBackup policy defines the backup criteria for a specific group of one or more clients. These criteria include:

◆ storage unit and media to use

◆ backup schedules

◆ clients to be backed up

◆ script files to be executed on the clients

To use NetBackup for SAP on Windows, at least one SAP policy with the appropriate schedules needs to be defined. A configuration can have a single policy that includes all clients or there can be many policies, some of which include only one client.

Most requirements for SAP policies are the same as for file system backups. In addition to the attributes described here, there are other attributes for a policy to consider. Refer to the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed configuration instructions and information on all the attributes available.

Adding New Policies

Use this procedure when configuring a policy from a UNIX server.

▼ **To add a new policy**

Note This policy name can be specified in the `initSID.utl` file on the client.

1. Log onto the server as root.

2. Start the NetBackup Administration Console.

3. If your site has more than one master server, choose the one to which you want to add the policy.

4. In the left pane, click on **Policies**. The right pane splits into an All Policies pane and a details pane.

5. In the All Policies pane, right-click on the Master Server, and click **New**.

The Add a New Policy dialog is displayed.
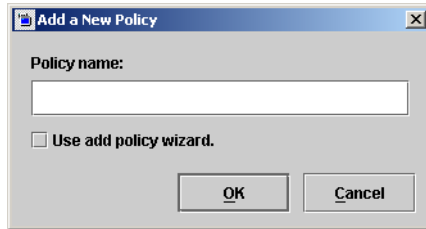
a. In the **Policy name** box, type a unique name for the new policy.

b. Choose whether to use the wizard for configuring the policy. The wizard guides you through most of the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy. You will need to manually add entries to the Backup Selections list after completing the wizard.

   ◆ To use the wizard, select the **Use add policy wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the SAP policy type.

Note The SAP policy type will not appear in the drop-down list unless your server has a license key for NetBackup for SAP on Windows.

   ◆ If you require more control over the settings than the wizard provides, do not select the **Use add policy wizard** box and proceed to step 6.

6. Click **OK**.

A dialog is displayed in which you can specify the general attributes for the policy.
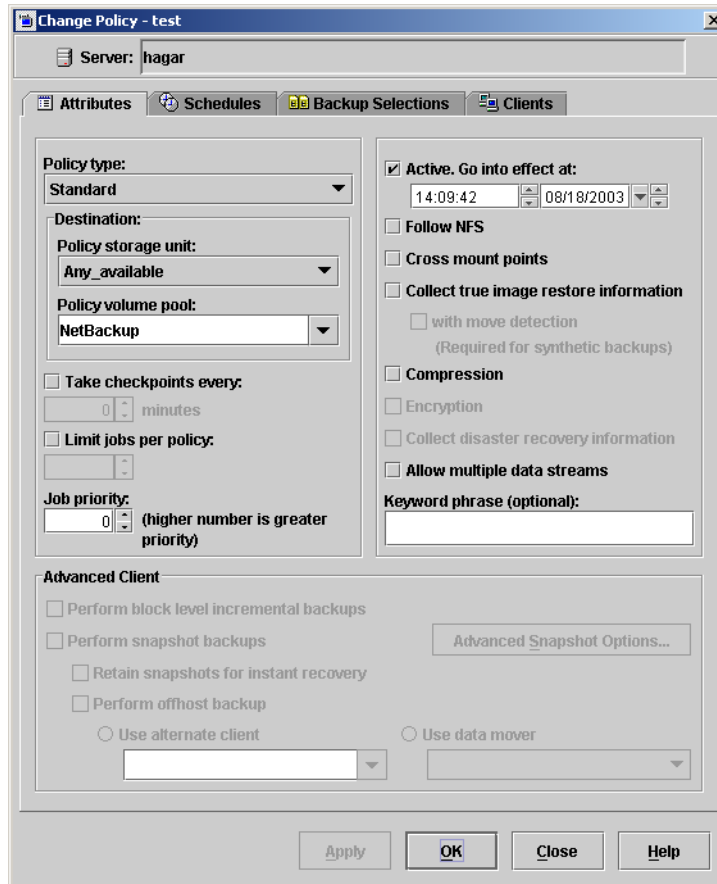
7. From the **Policy type** box, select the SAP policy type.

8. Complete the entries on the **Attributes** tab as explained in "Description of Attributes" and click **Apply** to save the attribute entries.

9. Add other policy information:

    ◆ To add schedules, see "Adding New Schedules."

    ◆ To add clients, see "Adding Clients to a Policy."

    ◆ To add scripts, see "Specifying the List of Backup Selections."

10. Click **Apply**. The new policy is created.

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for SAP backups are explained below.

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the policy attributes.

Description of Policy Attributes

Attribute	Description
Policy type	Determines the type of clients that can be in the policy and in some cases the types of backups that can be performed on those clients. To use NetBackup for SAP on Windows, you must have defined at least one SAP policy.
Keyword phrase to associate with the backup	For NetBackup for SAP on Windows, the keyword phrase entry is ignored.

Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

A server-directed, scheduled SAP backup requires at least two specific schedule types: an Application Backup schedule and an Automatic Backup schedule. You can also create additional schedules.

The following procedures explain how to configure the required schedule types, and how to add other new schedules. The procedures start from the Policy dialog. To see the Policy dialog, double click the policy in the policy list in the left pane of the NetBackup Administration Console.

▼ **To configure an Application Backup schedule**

1. In the Policy dialog, click the **Schedules** tab.

2. In the Schedule list, double-click on the schedule named
   Default-Application-Backup.

   A dialog is displayed. The title bar shows the name of the policy to which you are adding the schedule.

All SAP database operations are performed through NetBackup for SAP on Windows using an Application Backup schedule. This includes those backups started automatically.

You must configure an Application Backup schedule for each SAP policy you create. If you do not do this, you will not be able to perform a backup. To help satisfy this requirement, an Application Backup schedule named *Default-Application-Backup* is automatically created when you configure a new SAP policy.

3. Specify the other properties for the schedule as explained in "Schedule Properties."

The backup window for an Application Backup schedule must encompass the time period during which all NetBackup jobs, scheduled and unscheduled, will occur. This is necessary because the Application Backup schedule starts processes that are required for all NetBackup for SAP on Windows backups, including those started automatically.

For example, assume that you:

◆ expect users to perform NetBackup operations during business hours, 0800 to 1300.

◆ configured automatic backups to start between 1800 and 2200.

The Application Backup schedule must have a start time of 0800 and a duration of 14 hours.

| **Tip** | Set the time period for the Application Backup schedule for 24 hours per day, seven days per week. This ensures that your NetBackup for SAP on Windows operations are never locked out due to the Application Backup schedule. |

Example Settings for an Application Backup schedule

Type of Backup	Schedule settings	Description	Settings
Application Backup	Retention	The length of time backup images are stored.	2 weeks
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday through Saturday 00:00:01 - 23:59:59

| **Note** | The Application Backup schedule name can be specified in the `initSID.utl` file on the client. |

▼ **To configure an automatic backup schedule**

1. In the Policy dialog, click the **Schedules** tab.

2. Click **New**.

    A dialog is displayed. The title bar shows the name of the policy to which you are adding the schedules.

3. Specify a unique name for the schedule.

4. Select the **Type of Backup**.

    For information on the types of backups available for this policy, see "Types of Backups."

Refer to the following tables for example settings for an Automatic Backup schedule.

Example Settings for a Automatic Backup Schedule

Type of Backup	Schedule settings	Description	Settings
Automatic Backup	Retention	The length of time to store the record of a backup.	2 weeks
	Frequency	Frequency determines how often a backup should be performed	every week
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday, 18:00:00 - 22:00:00

5. Specify the other properties for the schedule as explained in "Schedule Properties."

6. If this is the last schedule, click **OK**.

Types of Backups

Description of Backup Types for SAP

Application Backup	The Application Backup schedule enables user-controlled NetBackup operations performed on the client. At least one Application Backup schedule type must be configured for each SAP policy. The Default-Application-Backup schedule is automatically configured as an Application Backup schedule.
Automatic Backup	An Automatic Backup schedule specifies the dates and times when NetBackup will automatically start backups by running the SAP scripts in the order that they appear in the file list. If there is more than one client in the SAP policy, the SAP scripts are executed on each client.

Schedule Properties

Some of the schedule properties have a different meaning for database backups than for a regular file system backup. These properties are explained in the following table.

Other schedule properties vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for detailed explanations of the schedule properties.

Description of Schedule Properties

Property	Description
Type of backup	Specifies the type of backup that this schedule will control. The selection list shows only the backup types that apply to the policy you are configuring.
	For more information see the following section "Types of Backups."
Frequency	This setting is used only for scheduled backups, and not for user-directed backups. **Frequency** specifies the period of time that will elapse until the next backup operation can begin on this schedule. For example, if the frequency is seven days and a successful backup occurs on Wednesday, the next full backup will not occur until the following Wednesday. Normally, incremental backups will have a shorter frequency than full backups.
Calendar	This setting is used only for scheduled backups, and not for user-directed backups. The **Calendar** option allows you to schedule backup operations based on specific dates, recurring week days, or recurring days of the month.
Retention	**Frequency based scheduling**
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred.
	The NetBackup scheduler compares the latest record to the frequency to determine whether a backup is due. This means that if you set the retention period to expire the record too early, the scheduled backup frequency will be unpredictable. However, if you set the retention period to be longer than necessary, the NetBackup catalog will accumulate unnecessary records. *Therefore, set a retention period that is <u>longer</u> than the frequency setting for the schedule.*
	For example, if the frequency setting is set to one week, set the retention period to be more than one week.
	Calendar based scheduling
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred. However, this setting is not significant for calendar based scheduling.

Description of Schedule Properties (continued)

Property	Description
Multiple copies	If you are licensed for the Inline Tape Copy feature and wish to specify multiple copies for your SAP policy, configure **Multiple copies** on the Application Backup schedule.

Adding Clients to a Policy

The client list is the list of hosts on which your NetBackup for SAP on Windows backups will be performed. A NetBackup client must be in at least one policy but can be in more than one.

This procedure starts from the Policy dialog. To see the Policy dialog, double-click the policy in the policy list in the left pane of the NetBackup Administration Console.

Requirements for clients

The following software must be installed on the client:

◆ SAP

◆ NetBackup client or server

◆ the backup or restore script(s)

▼ **To add clients to a policy**

1. In the Policy dialog, click the **Clients** tab.

2. On the **Clients** tab, click **New**.

   The Add Client dialog is displayed. The title bar shows the name of the policy where you are adding clients.
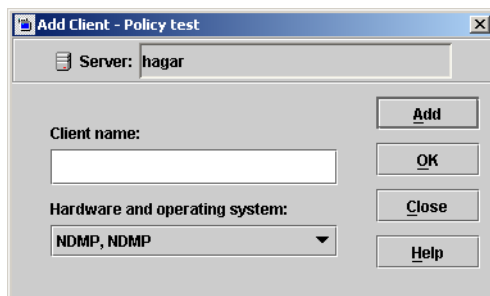
3. In the **Client name** text box, type the name of the client that you are adding.

4. Choose the **Hardware and operating system** type and click **Add**.

5. If this is the last client, click **OK**. If you are going to add more clients, repeat step 3 and step 4.

Specifying the List of Backup Selections

The Backup Selections list in a database policy has a different meaning than for non-database policies. For example, in a Windows-NT policy, the list contains files and folders to be backed up. In a database policy, the list contains script.

Add scripts only if you are setting up a policy for automatic scheduling. All scripts listed in the Backup Selections list will be executed for the Automatic Backup schedules as specified under the **Schedules** tab. NetBackup will start backups by running the scripts in the order that they appear in the Backup Selections list.

The following procedure starts from the Policy dialog. To see the Policy dialog, double-click the policy in the **Policies** list in the NetBackup Administration Console.

▼ **To add scripts to the Backup Selections List**

1. In the Policy dialog, click the **Backup Selections** tab.

2. Click **New**.

A dialog is displayed. The title bar shows the name of the policy to which you are adding the scripts.
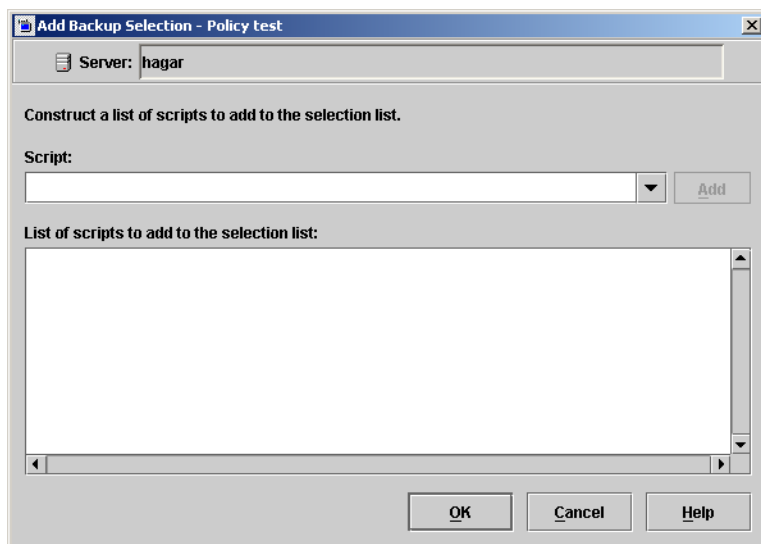
3. Type the name of the SAP script.

   Be sure to specify the full pathname when listing SAP scripts. For example:

   `install_path\NetBackup\dbext\sap\scripts\`

   Be sure that the SAP scripts listed here are installed on each host in the Client list.

   Refer to "Creating Scripts" on page 43 for details on creating scripts.

4. Click **Add**.

5. To add more scripts, repeat step 3 and step 4.

6. When you are finished adding backup selections, click **OK**.

Creating Scripts

The following example scripts were included with the NetBackup for SAP on Windows installation:

```
sap_offline_backup.cmd
sap_online_backup.cmd
sap_redo_log_backup.cmd
```

These scripts were installed in the following folder:

install_path\NetBackup\dbext\sap\scripts\

Be sure to modify these scripts for your environment.

Although each script can have multiple SAP Tools operations, a separate script is required for each type of operation. For example, you need separate scripts for backups and restores.

Caution	Always specify the correct script when configuring automatic backups or when starting operations through NetBackup. NetBackup for SAP on Windows will not generate an error if a restore script is used for a backup operation or a backup script is used for a restore operation.

Instructions for Modifying Scripts

1. If necessary, copy the example scripts to a different directory on your client. SAP scripts can be located anywhere on the client.

2. Modify the sap_offline_backup.cmd script.

   a. Use a text editor to open the sap_offline_backup.cmd script.

   b. Follow the instructions in the sap_offline_backup.cmd script.

Note	Test the scripts you just created. Refer to "Testing NetBackup for SAP on Windows Configuration Settings" on page 51.

sap_offline_backup.cmd script

```
@REM
@REM $Header: sap_offline_backup.cmd,v 1.3 99/03/31 13:42:03 mdp Stab $
```

```
@REM
@echo off

REM This environment variable are created by Netbackup (bphdb)

echo SAP_SCHEDULED = %SAP_SCHEDULED%
echo SAP_USER_INITIATED = %SAP_USER_INITIATED%
echo SAP_SERVER = %SAP_SERVER%
echo SAP_POLICY = %SAP_POLICY%


REM --------------------------------------------------------------------------
REM Replace cer below with the Oracle SID of the target database.
REM --------------------------------------------------------------------------

set ORACLE_SID=cer

REM --------------------------------------------------------------------------
REM Replace c:\oracle below with the Oracle home path.
REM --------------------------------------------------------------------------

set ORACLE_HOME=c:\oracle

REM --------------------------------------------------------------------------
REM Replace path with the correct sap archive path.
REM --------------------------------------------------------------------------

set SAPARCH=%ORACLE_HOME%\%ORACLE_SID%\saparch

REM --------------------------------------------------------------------------
REM Replace path with the correct sap backup path.
REM --------------------------------------------------------------------------

set SAPBACKUP=%ORACLE_HOME%\%ORACLE_SID%\sapbackup

REM --------------------------------------------------------------------------
REM Replace path with the correct sap reorg path.
REM --------------------------------------------------------------------------

set SAPREORG=%ORACLE_HOME%\%ORACLE_SID%\sapreorg

REM --------------------------------------------------------------------------
REM Replace path with the correct BRBACKUP path.
REM --------------------------------------------------------------------------

set BRBACKUP=c:\usr\sap\%ORACLE_SID%\sys\exe\run\brbackup

REM Full offline backup

set CMD_LINE=%BRBACKUP% -u internal/ -c -d util_file -t offline -m all
%CMD_LINE%

REM --------------------------------------------------------------------------
REM To communicate with NetBackup's job monitor for an automatic schedule
REM a "STATUS_FILE" variable is created by NetBackup (bphdb) that contains
```

```
REM a path to a file.  This file is check by Netbackup to determine if the
REM automatic schedule was successful.  It is up to the script to write
REM a 0 (passed) or 1 (failure) to the status file to communicate to NetBackup
REM the status of the execution of the script.  The following code echo a 0
REM to %STATUS_FILE% if succcessful and echo a 1 to %STATUS_FILE% for a
REM failure.
REM ----------------------------------------------------------------------

if errorlevel 1 goto errormsg
echo BRBACKUP successful
if "%STATUS_FILE%" == "" goto end
if exist %STATUS_FILE% echo 0 > %STATUS_FILE%
goto end

:errormsg
echo Execution of BRBACKUP command failed - exiting
if "%STATUS_FILE%" == "" goto end
if exist %STATUS_FILE% echo 1 > %STATUS_FILE%

:end
```

Script Parameters

A number of parameters are necessary in SAP scripts to enable SAP utilities to perform backup and restore operations. The parameters can come from one of three sources:

◆ Environmental Variables

◆ Parameter File (init*SID*.sap & init*SID*.utl), where *SID* is the instance.

◆ NetBackup Configuration GUI

The different parameter sources can be used to create different SAP scripts to perform different database backup/restore tasks. For example, the *$SAP_POLICY* can be defined in an SAP script to perform different types of backups (on-line, off-line, or redo logs).

It is also important to note that some environmental variables are created locally when an SAP script is executed through NetBackup's Automatic Scheduler.

When NetBackup's Automatic Scheduler calls an SAP script, the following environmental variables are created.

$SAP_POLICY	Name of the NetBackup SAP policy.
$SAP_SERVER	Name of the NetBackup server.
$SAP_SCHEDULED	Set to `1` if this is an automatic backup (Scheduled SAP).

Enabling Database User Authentication

Because the NetBackup Client service is, by default, started under the SYSTEM account, special attention must also be given to database user authentication. The SYSTEM account will not have permission to connect to the target database if you are using OS Authentication instead of passwords. If you are using OS Authentication, you must run the NetBackup Client service under an account that has SYSDBA privilege. To do this:

▼ **To change the user account for the NetBackup client services**

1. Choose **Start** > **Settings** > **Control Panel**.

2. From the Control Panel, open **Services**.

3. Highlight **NetBackup Client Service** and click on **Stop**.

4. Click **Startup**.

5. From the **Log ON As:** pane, select **This Account**.

6. Type in the account name with SYSDBA privileges.

7. Type in the password.

8. Click **OK**.

9. Click **START** to restart the service.

Configuring the initSID.utl File

Configure the NetBackup for SAP on Windows by modifying the `backint -p par_file` or the `initSID.utl` file. These are text files submitted to the NetBackup for SAP on Windows `backint` interface by SAP Tools with the `-p` *par_file* parameter. The *sort_backup_type*, *sort_restore_type*, and *custom_sort_file* parameters must be added to the parameter file to improve performance. The name of the *par_file* is specified on the *util_par_file* parameter in the profile file (see "Configuring the initSID.sap File" on page 49). SAP Tools determines the name of the *par_file* through the profile file.

1. Create a Parameter File.

Copy the parameter file from the NetBackup folder to the `%ORACLE_HOME%\`database folder. If the Oracle instance is SAP, copy the NetBackup example `.utl` file to `initSAP.utl` as follows:

```
copy install_path\NetBackup\dbext\sap\scripts\initSAP.utl
   c:\oracle\SAP\database\initSAP.utl
```

If a parameter file already exists, make sure the original copy is saved.

2. Set the parameter to the desired value.

Modify `initSAP.utl` with a text editor. Set parameter *policy*, *schedule*, *client*, *server*, *switch_list*, *switch_sem*, *switch_log*, and *drives* to valid values. The following steps set the *policy* parameter.

a. Use a text editor to open the `initSAP.utl` file.

b. Find the following line.

```
policy mdp_sap
```

c. Change `mdp_sap` policy name to the name created in NetBackup.

```
policy Example_SAP
```

Repeat Step 2 for each parameter you would like to change. For example, the following are parameters that will need to be adjusted for your configuration:

```
policy SAP_backup
schedule Default-Application-Backup
client puffin
server puffin
drives
switch_list  F:\oracle\SID\SAPBackup\.switch.lis
switch_sem   F:\oracle\SID\SAPBackup\.switch.sem
switch_log   F:\oracle\SID\SAPBackup\.switch.log
```

> **Note** Oracle substitution character (? or @) and environmental variable (*%ORACLE_HOME%*) are not allowed in the *par_file* file.

Configuring the initSID.sap File

Configure the SAP software by notifying the SAP Tools that you are using the NetBackup for SAP on Windows `backint` interface. This is done by modifying a few parameters in the SAP profile file. The *backup_dev_type* parameter needs to be set equal to *util_file* and the *util_par_file* parameter needs to point to the `init(SID).utl` file.

1. Locate the Profile file.

The profile file needs to be configured to tell the SAP Tools to use the NetBackup for SAP on Windows `backint` interface. In `%ORACLE_HOME%\`database, find the existing `initSID.sap` configuration file. For example, if the instance is SAP, you will find `initSAP.sap`. If one does not exist, copy the sample file from NetBackup as follows:

```
copy install_path\NetBackup\dbext\sap\scripts\initSAP.utl
   c:\oracle\SAP\database\initSAP.sap
```

2. Save the Original Profile

Since the profile file needs to be modified, it is important to save a copy of the original. If problems are encountered, restore the old configuration file. One way to save it is to copy the existing `initSID.sap` configuration file to `initSAP.sap.org` as follows:

```
cd %ORACLE_HOME%
cd database
copy initSAP.sap initSAP.sap.org
```

3. Set parameter *backup_dev_type*.

a. Use a text editor to open the `initSAP.sap` file.

b. Find the following line.

```
backup_dev_type = tape
```

c. Copy and paste this line under the original.

```
backup_dev_type = tape
backup_dev_type = tape
```

d. Comment out the original line.

```
#backup_dev_type = tape
backup_dev_type = tape
```

e. Change *tape* to *util_file*.

```
#backup_dev_type = tape
backup_dev_type = util_file
```

4. Set parameter *util_par_file*.

The next step is to continue to modify text file `initSAP.sap` with a text editor and set the parameter *util_par_file* equal to the `backint` parameter file. The `backint` parameter file is the same file modified in the "Configure the `initSID.utl` File" on page 32. This can be done by the following:

a. Find the following

```
#util_par_file = <file path>
```

b. Copy and paste this line under the original.

```
#util_par_file = <file path>
#util_par_file = <file path>
```

c. Uncomment the original line.

```
#util_par_file = <file path>
util_par_file = <file path>
```

d. Optional: Change the *util_par_file* to the absolute path of the parameter file.

```
#util_par_file = <file path>
util_par_file =?\database\init@.utl
```

Here is what these changes look like:

```
backup_dev_type = util_file
util_par_file = ?\database\init@.utl
```

Note When the profile file is interpreted by the SAP Tools, the ? and @ characters will be substituted with the value assigned to the environmental variables *%ORACLE_HOME%* and *%ORACLE_SID%* respectively.

Testing NetBackup for SAP on Windows Configuration Settings

After configuring the master server for NetBackup for SAP on Windows, test the configuration settings. For a description of status codes, refer to the *NetBackup Troubleshooting Guide for UNIX and Windows*.
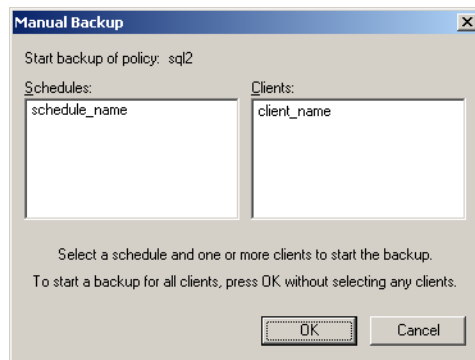
NetBackup Administration Console for Windows

Use this procedure to test a policy configuration from a Windows server or from the Remote Administration Console.

▼ **To test the configuration settings on a Windows server**

1. Log onto the server as administrator.

2. Start the NetBackup Administration Console.

3. In the left pane, click **Policies**. The policy list appears in the right pane.

4. Click on the policy you wish to test.

5. Choose **Actions** > **Manual Backup**.

   The Manual Backup dialog is displayed.

   The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.

6. Follow the instructions on the dialog.

7. Click **Activity Monitor** on the NetBackup Administration Console.

If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.

NetBackup Administration Console for UNIX

Use this procedure to test a policy configuration on the NetBackup Administration Console for UNIX.

▼ **To test the configuration settings on a UNIX server**

1. Log onto the server as root.

2. Start the NetBackup Administration Console.

3. In the left pane, click **Policies**.

The right pane splits into an All Policies pane and a details pane.

4. In the All Policies pane, click the policy you wish to test.

5. Choose **Actions** > **Manual Backup**.

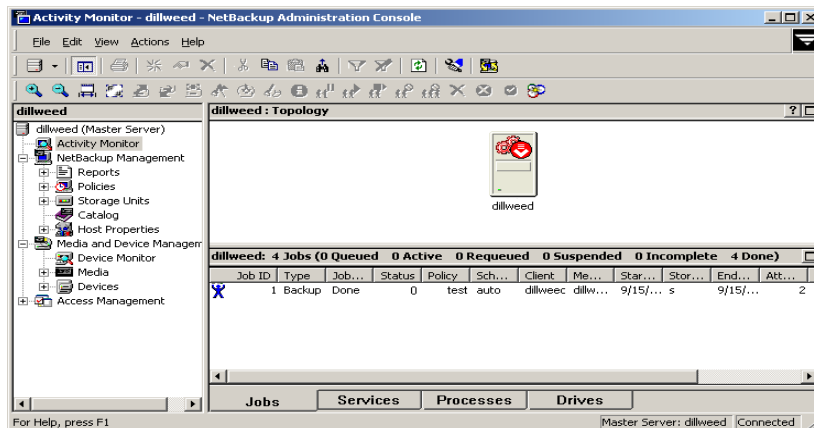The Manual Backup dialog is displayed.

The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.

6. Follow the instructions on the dialog.

7. Click **Activity Monitor** on the NetBackup Administration Console.

If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.

Testing Multiple Drives and Files

To test multiple drives, you must have:

◆ more than one tablespace to back up

◆ multiple tape drives to write to at the same time

You can also use the MPX value to simulate multiple tape drives.

1. Complete the configuration of NetBackup, NetBackup for SAP on Windows, and SAP Tools as described previously in this chapter.

2. Change the number of drives in `%ORACLE_HOME%`\database\initSAP.utl to equal the number of tape drives (MPX value X number of tape drives = drives). Refer to "drives" on page 88 for examples.

```
drives 2
```

When you perform a backup, you should see two or more backups running, depending upon how many drives you have identified in the `%ORACLE_HOME%`\database\initSAP.utl parameter file. The number of drives in the utility file should match the number of drives multiplied by the MPX value. The NetBackup for SAP on Windows `backint` interface will wait for all backups to complete before reporting success or failure to `brbackup`.

Using NetBackup for SAP on Windows   **4**

When all installation and configuration is complete, you can start SAP backups and restores through NetBackup.

This chapter contains the following sections:

◆ Performing a Backup

◆ Performing an Archive

◆ Performing a Restore

Caution	Always specify the correct SAP script when configuring automatic backups or when starting operations through NetBackup (see "Creating Scripts" on page 43). NetBackup for SAP on Windows will not generate an error if a restore SAP script file is used for a backup operation or a backup SAP script is used for a restore operation.

Performing a Backup

This section contains the following information.

◆ Backup of an SAP Policy

◆ Using SAP to Perform a Backup

Backup of an SAP Policy

Automatic Backup

The most convenient way to back up your database is to set up schedules for automatic backups. When the NetBackup scheduler invokes a schedule for an automatic backup, the SAP scripts run:

◆ In the same order as they appear in the file list

◆ On all clients that have them (that is, matching path names)

The SAP scripts will start the database backup.

The instructions in the previous chapter, Configuration, explain how to create and configure a policy that will use the SAP scripts you create to automatically back up your database according to the schedules you specify. To add a new schedule or change an existing schedule for automatic backups, follow the guidelines in "Adding New Schedules" on page 22.

Manual Backup

The administrator can use the NetBackup server software to manually execute an automatic backup schedule for the SAP policy. Refer to "Testing NetBackup for SAP on Windows Configuration Settings" on page 51 for instructions on initiating a manual backup of an Oracle policy.

Using SAP to Perform a Backup

There are two ways to start a backup:

◆　`sapdba` utility menu

◆　`brbackup` command line

When the backup is started through the `sapdba` utility or the `brbackup` command, `brbackup` status messages will appear on the console. These messages report when the database server is started, or stopped. They also report when the backup mode of the tables is changed. The NetBackup for SAP on Windows `backint` interface is then started by the `brbackup` command. `brbackup` submits the files to be backed up.

The NetBackup for SAP on Windows `backint` interface will generate messages for each `bpbackup` program, and will show a progress log for each. Debugging messages and `bpbackup` log messages will also be displayed. During the file-online mode, each database file is backed up, one at a time. The NetBackup for SAP on Windows `backint` interface handles coordination with `brbackup` using a semaphore file.

Once all files are backed up, the full file list is displayed in the format required by the NetBackup for SAP on Windows `backint` interface specification as to success or failure. This format includes a Backup ID (BID) to be used for later restores. SAP Tools will maintain its own log of the backup session. The standard NetBackup logs will keep track of the images created. The NetBackup for SAP on Windows `backint` interface only needs to keep track of the BID date and time. This allows cross-referencing by `brrestore`.

sapdba Off-line Backup

1. Complete the configuration of NetBackup, NetBackup for SAP on Windows, and SAP Tools as described in "Configuration Using the NetBackup Administration Console for Windows" on page 16 or "Configuration Using the NetBackup Administration Console for UNIX" on page 29.

2. As user sapadm, stop SAP by executing the `stopsap R3` command.

3. Start `sapdba`.

```
_____

SAPDBA V4.0B - SAP Database Administration - on WIN NT 4.0

_____

              ORACLE version: 8.0.4.0.0
              ORACLE_SID    : CER
              ORACLE_HOME   : c:\oracle
              DATABASE      : open
              SAPR3         : not connected

a - Startup/Shutdown instance    h - Backup database
b - Instance information          i - Backup offline redo logs
c - Tablespace administration     j - Restore/Recovery
d - Reorganization                k - DB check/verification
e - Export/import                 l - Show/Cleanup
f - Archive mode                  m - User and Security
g - Additional functions          n - SAP Online Help

q - Quit

Please select ==> h
```

4. Select the Backup database menu item by typing in **h**.

_____

                                Backup database
_____

                                Current value
    a - Backup function   Normal backup
    b - Parameter file   initCER.sap
    c - Backup device type   util_file
    d - Objects for backup   all
    e - Backup type   offline
    g - Query only   no
    h - Special options ...

    i - Standard backup   yes
    j - Backup from disk backup
    k - Restart backup
    l - Make part. backups compl.

    S - Start BRBACKUP
    q - Return

    Please select ==> d

5. Select an Object for backup by selecting **g** and typing **PSAPUSER1D**.

You will see the backup type is **util_file**, the backup type is **offline_force**, and tablespace is **PSAPUSER1D**.

```
_____

                              Backup database
_____


                                Current value
a - Backup function             Normal backup
b - Parameter file              initCER.sap
c - Backup device type          util_file
d - Objects for backup          PSAPUSER1D
e - Backup type                 offline
g - Query only                  no
h - Special options ...

i - Standard backup             yes
j - Backup from disk backup
k - Restart backup
l - Make part. backups compl.

S - Start BRBACKUP
q - Return

Please select  ==> s
```

6. Start the backup by typing **s**.

If everything is correct, you will first see sapdba and its command, brbackup, perform housekeeping on the Oracle database. brbackup will then start the NetBackup for SAP on Windows backint interface. When the backup is complete, the NetBackup for SAP on Windows backint interface generates a list of files that tells sapdba/brbackup that the backup was successful.

brbackup On-line Backup

You can use brbackup instead of sapdba to perform database backups. In this example we will do an on-line backup. You can change the backup_mode by changing the initSAP.sap parameter file or specifying -t online on the brbackup command.

Here is what these changes look like in initSAP.sap:

```
backup_type = online_file
```

This backup mode allows `sapdba/brbackup` to use a semaphore file with the NetBackup for SAP on Windows `backint` interface. This provides better on-line backup when doing very large files, since only the necessary tablespaces are placed in backup mode. When NetBackup is ready to process another file, it notifies `brbackup`. You can change the `backup_mode` to `online` to test this mode.

1. Complete the configuration of NetBackup, NetBackup for SAP on Windows, and SAP Tools as described in "Configuration" on page 15.

2. As the SAP administrator user, call `brbackup`.

    ```
    brbackup -d util_file_online -t online -m all
    ```

Performing an Archive

An archive is executed in a similar fashion as a backup. The `brarchive` command creates multiple successful backups before deleting the redo log file. NetBackup for SAP on Windows is used for each archive run.

Creating Backup Copies of Archive Logs

It is possible to create two backup copies of an archive log. You can store each copy on separate media, and retrieve them fairly easily. The `policy_log`, `sched_log`, and `second_secondary_archive` parameters were created to help facilitate this task.

In addition, there are two alternative methods to accomplish this task. We present all three methods here, along with the advantages and disadvantages of each methods. Depending on how you use NetBackup for SAP, choose the method of creating archive log backup copies that is easiest for you.

Solution 1: Using policy_log, sched_log, and second_secondary_archive Parameters

NetBackup For SAP has an ability to create a second backup copy of an archive log. This feature is regulated through optional parameters, `policy_log` and `schedule_log`, both located in `init<SID>.utl` file.

This feature, however, is not integrated with SAP Tools. SAP Tools are not "aware" of the second backup copy. Should first backup copy become unavailable, the user would have to know NetBackup (NB) backup id (BID) of the second backup copy in order to restore it.

Example

The user performs a backup of the archive log:

```
brarchive -d util_file -s
```

This will automatically find an archive log that is ready to be backed up, for example, `archive log 77`. Assuming that `policy_log` and `schedule_log` parameters were properly set, NetBackup for SAP will create two backup copies. These backup copies can be stored to disk or tape, two different tapes, or any desired backup media combination.

To restore `archive log 77`, issue the following command:

```
brrestore -d util_file -a 77
```

This will automatically determine the NB backup ID (BID) needed to restore the desired archive log. This backup ID is always for the first backup copy.

Unfortunately, `brrestore` is not aware of second copy. If the first backup copy is lost, `brrestore` will not be able to automatically find the second backup image that can be used for restore. The user will have to explicitly provide the alternative backup ID to `brrestore`. For example:

```
brrestore -d util_file -b2 NS0123456789 -m /ora/SAP/saparch/SAParch1_77.dbf
```

Advantages:

◆ Easy administration through `init<SID>.utl` file.

◆ Any combination of backup media can be used.

Disadvantages:

◆ In practice this presents administrator with an additional task of keeping track of NB backup IDs that can be used for restore in case first backup image is lost.

Solution 2: Using Two brarchive Commands in Sequence

The user can also create a backup copy of the archive log by issuing two `brarchive` commands in sequence. For the first copy, the user must call `brarchive` with the `-s` option. For the second copy, the user calls `brarchive` with the `-sc` option.

Example

Assume that there is only one archive log to be backed up, `archive log 77`. Both commands will automatically determine that it needs to be backed up and perform the backup.

To create the first backup copy, issue the following command:

```
brarchive -d util_file -s
```

To create the second backup copy, issue the following command:

```
brarchive -d util_file -sc
```

Following these backups, the user can restore the archived log files by issuing the `brrestore` command.

To restore the first backup copy:

```
brrestore -a 77
```

To restore the second backup copy:

```
brrestore -a2 77
```

Advantages:

◆ Both backup copies can be stored different media, two tapes, disk and tape or any desired combination.

◆ Restore is easy.

Disadvantages:

◆ `brarchive` has to be called two times.

◆ User must ensure that the first and second schedules specify different NetBackup schedules, because that is how NetBackup regulates which storage unit will be used.

Solution 3: Using Inline Tape Copy

Inline Tape Copy is a separately licensed feature of NetBackup. NetBackup for SAP users that also have the inline tape copy feature can use the feature to automatically create backup copies of the archive log file.

Example

To create two backup copies using inline tape copy, issue the following command:

```
brarchive -d util_file -s
```

This will create two backup copies that will be stored on two different tapes.

To restore the first available copy of the archive log file, issue the following command:

```
brrestore -d util_file -a <log_number>
```

Advantages:

◆ Inline tape copy results in a transparent restore. If first copy became unavailable, second copy will be picked up automatically.

◆ More than two copies can be created during backup.

Disadvantages:

◆ The only backup media currently supported is tape.

◆ Inline tape copy requires an additional license.

Performing a Restore

To restore a partial or full database, the `sapdba` system should be used to maintain the list of valid restores for specific tablespace or complete database restores. Refer to *BC SAP Database Administration* for restore examples.

Before restoring either individual tablespaces or full databases, the user is prompted prior to deleting an existing copy of the target file. `sapdba` will then invoke the `brrestore` command.

`brrestore` submits the BID and filename list to the NetBackup for SAP on Windows `backint` interface. The `backint` interface will cross-reference the exact date and time to when the backup was made and uses NetBackup to recover the file. The `backint` interface monitors the progress of the restore and reports status back to `brrestore`.

Upon completion, the `backint` interface saves a copy of the NetBackup restore logs for auditing purposes. `sapdba` then provides required database recovery, such as media recovery, and restarts the database server.

Redirecting a Restore to a Different Client

You have the option to restore an SAP Database to a client other than the one that originally supplied the backup. This process of restoring data to a different client is called a redirected restore.

In order to perform a redirected restore, the following conditions must be true:

◆ The source and destination clients must have identical computer system architecture and OS versions and bit-levels.

◆ The source and destination clients must have identical Oracle RDBMS levels.

Note In some situations it is possible to restore from lower to higher release levels of Oracle. Refer to the Oracle documentation or support for details.

The redirected restore is a 4 part process:

1. Configuring the NetBackup server

2. Copying files from the source client to the destination client

3. Configuring the NetBackup for SAP destination client

4. Performing the redirected restore

The following procedure explains each part of the process in detail. For more information on redirected restore, see the *NetBackup System Administrator's Guide.*

▼ **To perform a NetBackup for SAP redirected restore**

1. Configure the NetBackup server to allow redirected restores. You must be the NetBackup administrator to perform these tasks.

To remove restrictions for all clients, create the following file on the Netbackup master sever:

```
C:\Program Files\NetBackup\db\altnames\No.Restrictions
```

Or, to restrict clients to restore only from certain other clients, create the following file:

```
C:\Program Files\NetBackup\db\altnames\client_name
```

(where *client_name* is the name of the client allowed to perform the redirected restore). Add the name of the NetBackup for SAP source client to that file.

2. Copy configuration and control files from the NetBackup for SAP source client to the NetBackup for SAP destination client.

> **Note** Before overwriting the files on the destination client, back up the control files to preserve the original configuration. These files are usually in the `$ORACLE_HOME\database` folder.

The file copy can be accomplished by using ftp – File Transfer Protocol.

   a. Copy the following files from the source client (normally in `$ORACLE_HOME\database`) to the same directory on the destination client:

      ◆ init<SID>.sap

      ◆ init<SID>.utl

   b. Copy the following control files from `$ORACLE_HOME\sapbackup` on the source client to the same directory on the destination client.

      ◆ back<SID>.log

      ◆ SAP backup log file

        (This is an 8 letter file with extension that depends on the type of backup performed, for example, `bdhautdo.aff` for a full offline backup.)

3. Configure the NetBackup for SAP destination client as follows:

   a. Change the client paramter in the init<SID>.utl file on the destination client to the name of the source client.

   b. Alternately, set the SAP_CLIENT environment variable on the destination client to the name of the source client:

```
SAP_CLIENT=<source client>
export SAP_CLIENT
```

> **Note** The SAP_CLIENT variable has higher priority than the value in the init<SID>.utl file

   c. On the destination client, create a file path like the one on the source client, for example:

      ◆ source client actual path is

        `C:\Oracle\SAP`

      ◆ destination client actual path is

        `C:\Oracle\SAP`

> **Note** Do not use the `-m<dest_dir>` option with `brrestore` to achieve the same effect. This will result in the files being restored to the directory you specify, rather than in the original directories.

4. Perform the redirected restore.

    a. Log onto the NetBackup for SAP destination client.

    b. Perform the

        ```
        brrestore -d util_file -b last -m full
        ```

Troubleshooting 5

This chapter provides processes and resources to help you troubleshoot NetBackup for SAP on Windows, including logs and reports that NetBackup, NetBackup for SAP on Windows, and the SAP Tools provide. These reports are useful for finding errors associated with those applications.

This chapter includes the following sections:

◆ Setting the Debug Level

◆ NetBackup Reports

◆ `sapdba` Logs and Messages

◆ Preventing Timeout Failures on Large Database Restores

Setting the Debug Level

You can control the amount of information written to the debug log in the *install_dir*\NetBackup\logs\ folders by changing the Database debug level. The higher the value, the more information is logged. In everyday normal operations, the default value of 0 is sufficient. However, VERITAS Technical Support may ask you to set the value higher when a problem is being analyzed. 5 is the highest possible setting.

▼ **To change the Debug Level**

1. From the Start button, click **Programs**>**VERITAS NetBackup**>**Backup, Archive, and Restore**.

The Backup, Archive, and Restore interface appears.

2. Choose **File** > **NetBackup Client Properties**.

3. In the NetBackup Client Properties dialog, select the **Troubleshooting** tab.
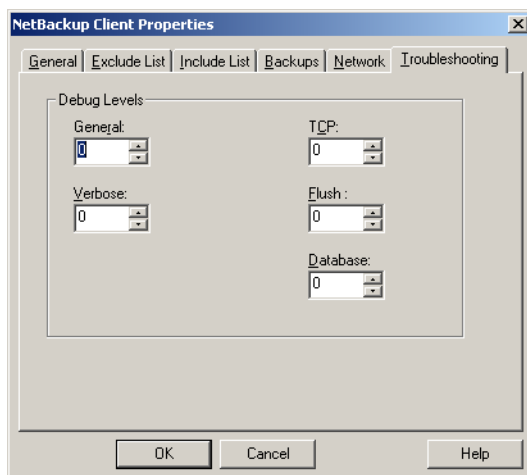
By default, the settings are zero.

4. Set the Database debug level.

Note Information from both settings will be logged to the same file, `mmddyy.log`

NetBackup Reports

The NetBackup server and client software allow you to set up detailed debug logs for troubleshooting problems that occur outside of either NetBackup for SAP on Windows or the SAP Tools. In addition to the NetBackup for SAP-specific directories explained in the following section, you should also create directories for general NetBackup client debug logs, such as `bpbackup`, `bprestore`, `bpbkar`, and `tar`. See the *NetBackup Troubleshooting Guide for UNIX and Windows* for a complete description of debug logs. Also see the *install_path*\NetBackup\logs\README.debug file.

> **Note** These logs do not reveal errors that occur during the execution of the SAP Tools, unless those errors also affect NetBackup for SAP. SAP may (or may not) use the NetBackup for SAP logs for errors in the application. Your best sources for SAP error information are the logs provided by SAP.

> **Note** In general, each debug log corresponds to a NetBackup process and executable.

▼ **To enable the NetBackup for SAP on Windows logs**

   1. Create the following folders on the client:

   ```
   install_dir\NetBackup\logs\bphdb
   install_dir\NetBackup\logs\backint
   ```

   ```
   % cd install_dir\NetBackup\logs\
   % mkdir bphdb
   % mkdir backint
   ```

   2. Make sure there is share access to the log folders.

The following sections describe the logs created when you create the log directories. Use a text editor to view the contents of the logs.

bphdb Folder on the Client

The *install_dir*\NetBackup\logs\bphdb folder contains the following types of logs. These logs are a good starting place to determine what type of error occurred.

sap_stdout.*mmddyy.hhmmss*.txt

   Unless redirected elsewhere, NetBackup places SAP script output in this file.

sap_stderr.*mmddyy.hhmmss*.txt

   Unless redirected elsewhere, NetBackup places SAP script errors in this file.

mmddyy.log

bphdb is the NetBackup Database Backup binary. This log contains debugging information for the bphdb process. NetBackup for SAP on Windows uses this client process for SAP script execution. It is invoked when an automatic backup schedule is executed.

backint Folder on the Client

The *install_dir*\NetBackup\logs\backint folder contains the following execution log.

mmddyy.log

This log contains debugging information and execution status for the SAP NetBackup client processes linked to the library program provided with NetBackup for SAP on Windows.

install_dir\NetBackup\logs\

NetBackup Server Reports

NetBackup provides other reports that are useful in isolating problems. One such report is All Logs Entries on the server. See the *NetBackup System Administrator's Guide for Windows, Volume I* or *NetBackup System Administrator's Guide for UNIX, Volume I* for a description of this and other reports.

sapdba Logs and Messages

The SAP Tools log provides information on the SAP part of the operation. This is the log the database administrator must check to determine the ultimate success or failure of the database backups and restores.

The `sapdba` utility log can view backup and restore logs. You can find them in the `sapdba` menu option: **Show/Cleanup**; **Show log files/profiles**. The same log information can be found in a few directories for `brbackup/brrestore` log information and `brarchive` log information.

Backup and Restore Folder

`%ORACLE_HOME%\sapbackup`

This directory contains files that represent different types of backups and restores.

```
backSID.log - summary log
encode timestamp.xyz - detail logs
```

where

> *SID* = a unique name for an Oracle database instance. Also known as System ID.
>
> *encoded timestamp* = a timestamp used in each detail log name which guarantees unique filenames
>
> *x* = a (all), p (partial)
>
> *y* = n (online), f (offline)
>
> *z* = f (utility_file_backup)
>
> *xyz* = rsb (restore backup files)
>
> *xyz* = rsa (restore archive files)
>
> *xyz* = rsf (restore individual files)

Archive Folder

%ORACLE_HOME%`saparch`

This folder contains files that represent different types of archives.

encode timestamp`.sve`   original saved

encode timestamp`.svd`   original saved and deleted

encode timestamp`.cpy`	original copied/saved a second time
encode timestamp`.cpd`	original copied/saved a second time and deleted
encode timestamp`.dcp`	deleted which were saved twice
encode timestamp`.dsv`	deleted which were saved

Preventing Timeout Failures on Large Database Restores

Large database restores sometimes fail when multiple restore sessions compete for resources. In this situation, a restore session can be delayed waiting for media or device access. If the delay is too long, the restore session times out.

This problem can be resolved by increasing the **Client Read Timeout** property, which prevents session timeouts and allows the restores to complete successfully.

Use the NetBackup Administration Console on the server to change the properties of each client that contains a database you may need to restore. The **Client Read Timeout** property is found on the Timeouts host properties dialog of the master and media servers. The default for the **Client Read Timeout** setting is 300 seconds (5 minutes). For database agent clients, increase the value significantly to prevent timeout errors, e.g. 30 minutes.

backint Command Line $\qquad$ **A**

The `backint` command line uses the following syntax.

```
backint -u user id -f function [-t type] -p par_file [-i in_file] [-o out_file]
```

-u *user id*	UID for backup utility user. No default. Required option.
-f *function*	This is a required parameter for the `backint` interface. It defines a key value that performs different functions between SAP and NetBackup. One of the following options is required.
backup	This is an optional parameter value for the -f *function* parameter. It supports and defines `brbackup` and `brarchive` to NetBackup. If backup is specified, NetBackup will perform a backup for SAP.
restore	This is an optional parameter value for the -f *function* parameter. It supports and defines `brrestore` to NetBackup. If restore is specified, then NetBackup will perform a restore for SAP.
inquiry	This is an optional parameter value for the -f *function* parameter. It supports and defines `sapdba` to NetBackup. This option is used by `sapdba` when a recovery is performed to get backup information for NetBackup.
-t *type*	This is an optional parameter for the `backint` command. It defines backup type, backup of individual files, and character special devices. If it is not specified the default value is `file`.
file	This is the default parameter value for the -t *type* parameter. It defines when to perform a backup, restore and inquiry function with datafiles, and special character devices. Backups from folders are not supported.

file_online	This is an optional parameter value for the `-t` *type* parameter. It allows `brbackup` to set tablespace into #BEGIN/#END backup mode when a related file backup takes place. It is used for on-line backups only. The architecture is based on three control files defined in the `-p` *par_file* parameter.
-p *par_file*	This is a required parameter for the `backint` command. It is a text file that contains comments, parameters (required and optional), and parameter values. These parameters determine the backup and restore procedure between NetBackup and SAP Tools.

Comments are denoted by # in the first column. Any other character in the first column is considered a valid parameter.

A required parameter must be specified with a valid value before the NetBackup for SAP on Windows `backint` interface will execute correctly. An optional parameter can be commented out by a # in the first column. If the optional parameters are specified, they must have valid values for the NetBackup for SAP on Windows `backint` interface to execute correctly. If an invalid parameter name is found, the NetBackup for SAP on Windows `backint` interface will report a warning message and will continue executing. For details on input file contents, refer to the following -i in_file parameter.

The SAP Tools parameter file (profile file; init*SID*.sap) specifies the location of this *par_file*. An example of this file is located in:

`install_path\NetBackup\dbext\sap\initSAP.utl`

For details on input file contents, refer to "backint -p par_file or initSID.utl" on page 87 of this manual. |
| -i *in_file* | This is an optional parameter for the `backint` command. It is a text file, the contents of which may vary, depending on the NetBackup for SAP on Windows `backint` interface function initiated. If this parameter is not specified, the contents of this file is data from standard input. For details on input file contents, refer to "backint -i in_file Contents" on page 79 of this manual. |

-o *out_file*	This is an optional parameter for the `backint` command. It is a text file that contains process messages for a function. If it is not specified, the output will go to standard output. For details on output file contents, refer to "backint -o out_file Contents" on page 81 of this manual.

backint -i in_file Contents B

The contents of the input text file will change depending on the function initiated by the NetBackup for SAP on Windows `backint` interface.

Backup Function

For the **backup** function, you may have the following entries.

file1	Set of file names to be saved.
special_file1 size1	Character special (raw) device files and the file size used by Oracle.

Restore Function

For the **restore** function, you may have the following entries.

backup_id file1 [*dest_dir1*]	BIDs of backups. Names of files and/or folders to be restored. Optional destination folder.
[#NULL *file2* [*dest_dir2*]]	Optional. Additional names of files and or folders with a different destination folder.

Inquiry Function

For the **inquiry** function, you may have the following entries.

#NULL	Lists the last backup.
[*backup_id*]	Optional BIDs will list all backups.
[#NULL *file1*]	Optional null with names of files and or folders will list all backups with the specified file/folder names.
[*backup_id file2*]	Optional BIDs and folders of files and or directories will list the specified files or folder names in the specified backups.

backint -o out_file Contents $\qquad$ C

The contents of the output text file will change depending on the function initiated by the NetBackup for SAP on Windows `backint` interface.

Backup Function

When a backup function is successfully completed, the output file entry will identify the BID assigned to the backup by NetBackup and will list the files and folders backed up.

`#SAVED` *backup_id* *file*

When a backup function fails, the output file entry will list the files that were not successfully backed up.

`#ERROR` *file*

Restore Function

When a restore function is successfully completed, the output file entry will identify the BID and list the files restored.

`#RESTORED` *backup_id* *file*

When a restore function fails, the output file will list the files and directories not found. It will also list the files and folders that were not successfully restored.

`#NOTFOUND` *file*
`#ERROR` *file*

Inquiry Function

When an inquiry function is successfully completed, the output file entry will identify the BID assigned to the backup by NetBackup and/or will list the files backed up.

```
#BACKUP backup_id
#BACKUP backup_id file
```

When an inquiry function fails, the output file lists the files that where not successfully backed up.

```
#ERROR file
```

Environment Variable **D**

The NetBackup for SAP on Windows `backint` interface will recognize the following environmental variables.

$SAP_SERVER   This environmental variable sets the name of the NetBackup server. It can be used to override the current server and perform a backup to an alternative server. This environmental variable is the same as the `server` parameter in the *par_file* (init*SID*.utl) file and the SERVER option in the NetBackup `bp.conf` file.

$SAP_CLIENT   This environmental variable sets the name of the NetBackup client. It can be used to override the current client and perform an alternate restore to a different client. This variable is the same as the `client` parameter in the *par_file* (init*SID*.utl) file and the CLIENT_NAME option in the NetBackup `bp.conf` file.

$SAP_POLICY   This environmental variable sets the name of the NetBackup policy. This policy can be used to define different types of database backups. One policy type can be used to perform offline database backups, and another policy type can be used to perform archive log backups. This environmental variable is the same as the `policy` parameter in the *par_file* (init*SID*.utl) file and the BPBACKUP_POLICY option in the NetBackup `bp.conf` file.

$SAP_SCHED   This environmental variable sets the name of the SAP *Backup Policy* schedule. This schedule provides an easy way to switch to a different schedule for each SAP database backup. This environmental variable is the same as the `schedule` parameter in the *par_file* (init*SID*.utl) file and the BPBACKUP_SCHED option in the NetBackup `bp.conf` file.

$SAP_DRIVES   This environmental variable sets the number of simultaneous `bpbackup/bprestore` operations the NetBackup for SAP on Windows `backint` interface will execute. This environmental variable is the same as the `drives` parameter in the *par_file* (init*SID*.utl) file.

bp.conf File   E

There are a number of parameters that can be specified in either the
`install_path`\netbackup\bp.conf file or the *$HOME*\bp.conf file. These
parameters will be used by the NetBackup for SAP on Windows backint interface if they
are not found as an environmental variable or in the *par_file* (init*SID*.utl) file. The
server, client, policy and schedule parameters in the *par_file* (init*SID*.utl) can
all be defined in the bp.conf file. The following is a list of the variable names and
definitions.

SERVER	This is the option, in the bp.conf file, which names the NetBackup server. This option is the same as the *$SAP_SERVER* environment variable and the server parameter in the -p *par_file* file.
CLIENT_NAME	This is the option, in the bp.conf file, which names the NetBackup client. This option is the same as the *$SAP_CLIENT* environment variable and the client parameter in the -p *par_file* file.
BPBACKUP_POLICY	This is the option, in the bp.conf file, which names the NetBackup policy. This option is the same as the *$SAP_POLICY* environment variable and the policy parameter in the -p *par_file* file.
BPBACKUP_SCHED	This is the option, in the bp.conf file, which names the NetBackup schedule. This option is the same as the *$SAP_SCHED* environment variable and the schedule parameter in the -p *par_file* file.

See the *NetBackup System Adminstrator's Guide Volume II for UNIX* or the *NetBackup System
Administrator's Guide Volume II for Windows* for additional information on bp.conf.

backint -p par_file or initSID.utl — F

server

This is an optional parameter, used to define the machine name of the NetBackup master server. The NetBackup master server is the name of the machine that provides most of the administration and control for NetBackup operations. It contains the NetBackup database. The following is an example entry:

```
server jupiter
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_SERVER* environment variable, the `server` parameter value will be overridden by the *$SAP_SERVER* value. If the `server` parameter is not specified, and there is no environment variable, then the `server` parameter value will default to the SERVER option specified in NetBackup Configuration GUI.

client

This is an optional parameter, used to set a machine name that contains the NetBackup client software, an Oracle database, and an SAP environment. In some cases the server and client machine will be the same machine. The following is an example entry:

```
client saturn
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_CLIENT* environment variable, the `client` parameter value will be overridden by the *$SAP_CLIENT* value. If the `client` parameter is not specified, and there is no environment variable, then the `client` parameter value will default to the *CLIENT_NAME* option specified in the NetBackup Configuration GUI. If the value is not specified in the NetBackup Configuration GUI, the NetBackup for SAP on Windows `backint` interface uses the value returned by the `gethostname()` library function.

drives

This is an optional parameter, used to determine the number of `bpbackup/bprestore` commands that will be run. To maximize write performance to a tape, the `drives` value should be set to the number of tape drives multiplied by the MPX value per schedule. Based on the number of drives specified, the NetBackup for SAP on Windows `backint` interface will simultaneously run the same number of `bpbackup/bprestore` commands.

If, for example, MPX is set to 4 and there are two available tape drives, then the `drives` parameter should be set to 8 (4 X 2). The NetBackup for SAP on Windows `backint` interface will run eight `bpbackup/bprestore` jobs at the same time. As a result there will be four data streams going to each tape. The `drives` parameter should be set to the following rule:

`drives` = *Number of drives per policy* X *MPX value in schedule*

The `drives` parameter value should not exceed the Set Maximum Jobs per Client global attribute. The following is an example entry:

```
drives 5
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_DRIVES* environment variable, the `drives` parameter value will be overridden by the *$SAP_DRIVES* value. If the drive parameter is not specified and there is no environment variable, then the NetBackup for SAP on Windows `backint` interface will exit with an error.

policy

This is an optional parameter, used to set the name of an SAP policy type defined in NetBackup. The SAP policy must have a *Backup Policy* schedule defined in order for the NetBackup for SAP on Windows `backint` interface to work. The following is an example entry:

```
policy sap_nb
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_POLICY* environment variable, the `policy` parameter value will be overridden by the *$SAP_POLICY* value. If the policy parameter is not specified, and there is no environment variable, then the `policy` parameter value will default to the *BPBACKUP_POLICY* option in the NetBackup Configuration GUI. By default, if *BPBACKUP_POLICY* is not in any NetBackup Configuration GUI, NetBackup uses the first active SAP policy type it finds for the client with a Backup Policy backup schedule.

policy2

This is an optional parameter, used to set the name of an policy to be used for the secondary SAP backup. The secondary backup is performed for each SAP database backup on files that are needed to track SAP backup information. This option would be used to save the backup information on a different media. If `policy2` is not specified and `schedule2` is specified, then the `policy` parameter value is used.

schedule

This is an optional parameter, used to set the name of a *Backup Policy* schedule associated with an SAP policy type. The schedule can define aspects of the backup such as how long NetBackup retains images, maximum MPX per drive, storage unit, and volume pool. The following is an example entry:

```
schedule sap_full_backup
```

If the NetBackup for SAP on Windows backint interface finds a *$SAP_SCHED* environment variable, the schedule parameter value will be overridden by the *$SAP_SCHED* value. If the schedule parameter is not specified and there is no environment variable, then the schedule parameter value will default to the *BPBACKUP_SCHED* option in the NetBackup Configuration GUI. By default, if *BPBACKUP_SCHED* is not in any NetBackup Configuration GUI then, NetBackup uses the first *Backup Policy* schedule it finds in the first active SAP policy.

schedule2

This is an optional parameter, used to set the name of an Application Backup schedule to be used for the secondary SAP backup. If it is not specified, then the `schedule` parameter value is used.

For each SAP backup, there are two individual backups performed. The first backup is responsible for backing up database data. The second backup is responsible for backing up log files needed to track SAP backup information. Use this parameter to save SAP log files to a different media. This can make database restore/recovery easier. This option can be used to save the backup information to a different volume pool. The following is an example entry:

```
schedule2  sap_backup_information
```

switch_list

This is a required parameter that should be set only if Oracle and SAP reside on different drives. It is used as a control file to communicate with the NetBackup for SAP on Windows NT `backint` interface and `brbackup` for on-line backups. A switch list file is created every time `brbackup` wants to back up a file, or when it wants to indicate that a backup is finished. The `switch_list` parameter must be set to a file path located in:

`%ORACLE_HOME%/sapbackup/.switch.lis.`

The following is an example of a valid entry:

`switch_list  = F:\oracle\SID\SAPBackup\.switch.lis`

switch_sem

This is a required parameter that should be set only if Oracle and SAP reside on different drives. It is used as a control file between the NetBackup for SAP on Windows NT `backint` interface and `brbackup`. After the switch list file has been created and closed, the NetBackup for SAP on Windows NT `backint` interface creates the switch semaphore file and waits until it is deleted by `brbackup`. The `switch_sem` parameter must be set to a file path located in: `%ORACLE_HOME%`/sapbackup/.switch.sem. The following is an example of a valid entry:

`switch_sem  = F:\oracle\SID\SAPBackup\.switch.sem`

switch_log

This is a required parameter that should be set only if Oracle and SAP reside on different drives. It is used as a control file between the NetBackup for SAP on Windows NT `backint` interface and `brbackup`. After the switch semaphore file has been deleted, the NetBackup for SAP on Windows NT `backint` interface opens and reads the switch log file, created by `brbackup`, to determine if the process is successful. The `switch_log` parameter must be set to a file path located in:
`%ORACLE_HOME%/sapbackup/.switch_log`. The following is an example of a valid entry:

`switch_log  = F:\oracle\SID\SAPBackup\.switch.log`

sort_backup_type

This is optional parameter, used to specify one of four different backup sort parameter values [*size* | *custom* | *device* | *drive*]. If it is not specified, it will default to the *size* option.

The following is detailed information on each parameter value.

size

This is the default parameter value for the `sort_backup_type` parameter. The size feature will create `bpbackup` jobs based upon the number of drives specified in the `par_file` (drives 3). Each file being backed up will be associated with a backup job based on size. For example, if three tape drives are specified, the files will be divided evenly into three `bpbackup` jobs based on size. So, if there are 25 input files from SAP and three tape drives, then three `bpbackup` jobs would be running at the same time with the following files in each job.

Input file list from SAP (`brbackup, sapdba`)

```
c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
c:\dev\rdsk\c0t4d0s6  11812864
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
c:\oracle\sap\sapdata1\system_1\system.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
```

```
                        c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
                        c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
                        c:\oracle\sap\dbs\cntrlSAP.dbf
```

Backup Job 1

```
size= 36708352: file \name=c:\oracle\sap\sapdata1\roll_1\roll.data1
size= 10493952: file name=c:\oracle\sap\sapdata1\temp_1\temp.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
size=  5243392: file name=c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
Total=62947840
```

Backup Job 2

```
size= 15736832: file name=c:\oracle\sap\sapdata1\system_1\system.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\btabi_1\btabi.data1
size=  5251072: file name=c:\oracle\sap\sapdata5\ddici_1\ddici.data1
size=  5251072: file name=c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\poold_1\poold.data1
size=  5251072: file name=c:\oracle\sap\sapdata3\stabd_1\stabd.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\pooli_1\pooli.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\user1i_1\user1i.data1
size=  5243392: file name=c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
size=   231936: file name=c:\oracle\sap\dbs\cntrlSAP.dbf
Total=57969664
```

Backup Job 3

```
size= 11812864: file name=c:\dev\rdsk\c0t4d0s6
size=  5251072: file name=c:\oracle\sap\sapdata2\clud_1\clud.data
size=  5251072: file name=c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
size=  5251072: file name=c:\oracle\sap\sapdata4\protd_1\protd.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\sourced_1\sourced.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\stabi_2\stabi.data2
size=  5251072: file name=c:\oracle\sap\sapdata4\user1d_1\user1d.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\btabd_1\btabd.data1
size=  5243392: file name=c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
size=  5243392: file name=c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
Total=59057152
```

Note The number of drives specified does not have to equal the number of physical tape drives. The number of drives correlates to the number of simultaneous bpbackup jobs run by the NetBackup for SAP on Windows NT backint interface. For example, if you had 10 SAP files and three tape drives, you can specify 10 drives in the *par_file* (init*SID*.utl). This would cause 10 bpbackup jobs with one file for each bpbackup job. bpsched will handle all of the job scheduling. Initially, three

bpbackup jobs would be active and the other seven jobs would be queued. You can increase the number of active jobs and data throughput, by increasing the multiplex value for the policy.

custom

This is a parameter value for *sort_backup_type* parameter. If custom is specified, the *custom_sort_file* parameter needs to be set to a valid file path. An SAP Tools end-user must create the *custom_sort_file* file (see "custom_sort_file" on page 95"custom_sort_file" on page 95).

device

This is a parameter value for *sort_backup_type* parameter. This parameter value will create bpbackup jobs based on a file's device id. The number of tape drives specified in the int*SID*.utl file will not be used. For example, if there are 12 files requested for backup, and they reside on two different devices (X and Y), then two bpbackup jobs will be forked. The first job will contain all the files associated with device X and the next job will contain all the files on device Y. The following is an example of the sort by device option:

Input file list from SAP (`brbackup`, `sapdba`)

```
c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
c:\dev\rdsk\c0t4d0s6 11812864
d:\ORACLE2\sap\sapdata\btabd_5\btabd.data5
```

Backup Job 1 (all have the device id X)

```
c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
```

```
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
```

Backup Job 2 (all have the same device id Y)

```
c:\dev\rdsk\c0t4d0s6   11812864
```

Note The implementation is based on the *st_dev* value from `stat()` function. This identifies a file partition.

drive

This is a parameter value for the *sort_backup_type* parameter. It will create `bpbackup/bprestore` jobs based off of the number of simultaneous backup jobs specified by the *drives* parameter in the *par_file* (init*SID*.utl) file.

For example, if there are three tape drives and 10 SAP files, the following distribution will occur:

Input file list from SAP

```
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
c:\oracle\sap\sapdata1\system_1\system.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
```

Backup/Restore Job 1

```
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
```

Backup/Restore Job 2

```
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata1\system_1\system.data1
```

Backup/Restore Job 3

```
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
```

custom_sort_file

This is optional parameter, used only when the custom option is specified on either the *sort_backup_type* parameter or the *sort_restore_type* parameter. When custom is specified, the custom_sort_file parameter must be set to a valid file. The value must be a full path name to a custom sort file and must have public permissions. The following is an example of an entry:

install_path\NetBackup\dbext\SAP\Scripts\sap_custom_sort_file

The custom_sort_file must include two fields. The first field groups a set of files to a particular bpbackup job. Use the second field, file path name, to map the SAP backup file list to a group ID.

> **Note** Restore will fork another job for raw partition files, if they are grouped with regular files.

> **Note** If custom sort is not being used then the custom_sort_file parameter does not have to be specified in the *par_file* init*SID*.utl file (or it does not have to equal a valid file path).

Example of a Custom Sort File

```
1 c:\oracle\sap\sapdata1\btabd_1\btabd.data1
1 c:\oracle\sap\sapdata2\btabi_1\btabi.data1
1 c:\oracle\sap\sapdata2\clud_1\clud.data1
1 c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
1 c:\oracle\sap\sapdata5\ddici_1\ddici.data1
1 c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
1 c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
1 c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
1 c:\oracle\sap\sapdata2\poold_1\poold.data1
1 c:\oracle\sap\sapdata1\pooli_1\pooli.data1
1 c:\oracle\sap\sapdata4\protd_1\protd.data1
1 c:\dev\rdsk\c0t4d0s6
2 c:\oracle\sap\sapdata1\roll_1\roll.data1
2 c:\oracle\sap\sapdata2\sourced_1\sourced.data1
2 c:\oracle\sap\sapdata3\stabd_1\stabd.data1
2 c:\oracle\sap\sapdata2\stabi_2\stabi.data2
2 c:\oracle\sap\sapdata1\temp_1\temp.data1
2 c:\oracle\sap\sapdata4\user1d_1\user1d.data1
2 c:\oracle\sap\sapdata2\user1i_1\user1i.data1
2 c:\oracle\sap\sapdata1\system_1\system.data1
2 c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
2 c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
2 c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
2 c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
2 c:\oracle\sap\dbs\cntrlSAP.dbf
```

Based on the above custom sort file, if SAP submits the entire file list to be backed up, there would be two bpbackup jobs running at the same time. One job would have all the files that have a 1 in the first field. The second job would have all of the files that have a 2 in the first field. The following is a list of jobs and associated files:

Backup/Restore Job 1

```
c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
```

```
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
c:\dev\rdsk\c0t4d0s6
```

Backup/Restore Job 2

```
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
c:\oracle\sap\sapdata1\system_1\system.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
c:\oracle\sap\dbs\cntrlSAP.dbf
```

policy_log

`policy_log` is optional and is the name of a policy to be used for backing up a second copy of an archive log. If this option is specified then two backups will be performed on the same archive log. The first backup will go to the `policy` name option and the second backup will go to the `policy_log` name option.

```
policy_log sap_archive_logs
```

sched_log

`sched_log` is optional and is the name of a schedule to create a second backing up of an archive log. If this option is specified, then two backups will be performed on the same archive log. The first backup will go to the `schedule` option and the second backup will be go to the `sched_log` and option. The `sched_log` name must be a valid schedule name under the `policy_log` name option, otherwise it must be a valid schedule name under the `policy` name option.

```
sched_log Default-Policy
```

second_secondary_archive

second_secondary_archive is an optional parameter that can have a value of 0 or 1. If value is one (1), then 2 copies of secondary backup will be made. This parameter will have an effect only if policy_log and/or sched_log are specified. The first backup will go to the policy name option and the second backup will go to the policy_log name option. Furthermore, it will support brarchive but it will have no effect on brbackup.

retry_backup

retry_backup is an optional parameter and should be set to the number of retries for a failed backup. If this option is specified BACKINT will retry a failed bpbackup job. The number of retries is determine by the value on the retry_backup parameter.

retry_backup 2

fail_backup

fail_backup is optional and is used to stop the backup process immediately when an error occurs. The standard behavior of BACKINT is to continue processing even in the event of an error and then report what files failed and what files were successful. If this parameter is specified, then BACKINT will stop process on the first error and report failures for all the files that were not backed up.

fail_backup

Note fail_backup only pertains to a specific kind of online backup. It is effective only when tablespace is set to #BEGIN/#END backup mode and when a related file backup takes place. This means that BACKINT has to be called with "-t file_online" parameter.

Using NetBackup for SAP to Back Up SAPDB **G**

NetBackup for SAP (`backint` for Oracle) can be used to back up SAPDB RDBMS. SAP requires that backup applications must be able to back up any files in the file system, regardless of the existence of Oracle on that file system. External backup tools that fulfill this condition can be used to backup and restore SAPDB, and VERITAS NetBackup For SAP fulfills this condition.

SAPDB relies on an additional adapter program to communicate with NetBackup for SAP. The adapter program is part of the SAPDB distribution. This program necessitates some additional configuration for SAPDB backups.

Follow the regular NetBackup for SAP directions in the Configuration chapter to create a policy for SAPDB backups. This section provides the configuration that is additional to the configuration for a regular NetBackup for SAP backup. To use NetBackup for SAP to back up SAPDB, you must perform the following extra configuration steps:

◆ creating three configuration files on the SAPDB client

◆ defining a backup medium in SAPDB

Creating Backup Environment Configuration Files

In order to configure the backup environment to use NetBackup for SAP (`backint` for Oracle) to back up SAPDB, you must create three files on the NetBackup for SAP (SAPDB) client:

    ◆ `backint` for SAPDB configuration file

    ◆ adapter program configuration file

    ◆ NetBackup for SAP configuration file

backint for SAPDB Configuration File

The `backint` for SAPDB configuration file provides information about the adapter program to SAPDB. Set the environmental variable BSI_ENV to point to the name and location of this file. The configuration file can contain the following parameters:

Parameter	Description
BACKINT <absolute_path>\<file_name>	Absolute path and name of the `backint` program
INPUT <absolute_path>\<file_name>	Absolute path and name of the standard input file
OUTPUT <absolute_path>\<file_name>	Absolute path and name of the standard output file
ERROROUTPUT <absolute_path>\<file_name>	Absolute path and name of the standard error output file
PARAMETERFILE <absolute_path>\<file_name>	Absolute path and name of the configuration file of the `backint` for SAPDB program
TIMEOUT_SUCCESS <number>	Time in seconds that the Database Manager waits for the end of the started Backint for SAPDB if action is successful
TIMEOUT_FAILURE <number>	Time in seconds that the Database Manager waits for the end of the started `backint` for SAPDB if errors occur
ORIGINAL_RUNDIRECTORY <absolute_path>	Absolute path of the run directory of the source database

For a detailed description of these parameters, see the SAPDB documentation, available on www.sapdb.org.

The following is an example of a file with the minimum configuration specified:

```
BACKINT C:\sapdb\depend\bin\backint
INPUT C:\sapdb\logs\backint.in
OUTPUT C:\sapdb\logs\backint.out
ERROROUTPUT C:\sapdb\logs\backint.err
PARAMETERFILE C:\sapdb\indep_data\wrk\adapter.config
```

PARAMETERFILE specifies the name and location of the adapter program configuration file described in the following section.

Adapter Program Configuration File

The configuration file for the adapter program tells the adapter program where NetBackup for SAP (`backint` for Oracle) is and provides parameters to use in communication with NetBackup for SAP. Set the name and location of this file as the value for PARAMETERFILE in the `backint` for SAPDB configuration file. The adapter program file can contain the following parameters:

Parameter	Description
STAGING AREA: <absolute_path>\<file_name> <size> [KB | MB | GB]	Absolute path and size of a temporary file
FILES PER BACKINT CALL: <number>	Maximum number of temporary files that are to be processed by `backint` for Oracle concurrently.
BACKINT: <absolute_path>\<file_name>	Absolute path and name of the `backint` for Oracle program
PARAMETERFILE OF BACKINT: <absolute_path>\<file_name>h>	Absolute path and name of the configuration file for the `backint` for Oracle program
HISTORY FILE: <absolute_path>\<file_name>	Absolute path and name of the backup history
INPUTFILE FOR BACKINT: <absolute_path>\<file_name>	Absolute path and name of the standard input file
OUTPUT FILE FOR BACKINT: <absolute_path>\<file_name>	Absolute path and name of the standard output file
ERRORFILE FOR BACKINT: <absolute_path>\<file_name>	Absolute path and name of the standard error output file
MAXIMAL DELAY OF BACKINT CALL: <number>	Maximum waiting time in seconds between creating a temporary file and starting to save it by using `backint` for Oracle

Parameter	Description
OMIT LAST DIRECTORY DELIMITER ON RESTORE:<YES | NO>	Specifies whether the SAPDB adapter program ignores the closing slash (\) of an absolute directory name for backint for Oracle.
BI_CALLER_VALUE: <value>	Value of the environment variable BI_CALLER

For a detailed description of these parameters, see the SAPDB documentation, available at www.sapdb.org.

The following is an example of a file with the minimum configuration specified:

```
BACKINT: C:\Program Files\VERITAS\NetBackup\bin\backint
PARAMETERFILE OF BACKINT: C:\sapdb\indep_data\wrk\initSAP.utl
HISTORY FILE: C:\sapdb\logs\BackintHistory.log
INPUTFILE FOR BACKINT: C:\sapdb\logs\backintOracle.in
OUTPUTFILE FOR BACKINT: C:\sapdb\logs\backintOracle.out
ERRORFILE FOR BACKINT: C:\sapdb\logs\backintOracle.err
```

NetBackup for SAP Configuration File

The last file is the NetBackup For SAP configuration file, initSID.utl. This file is specified by PARAMETERFILE OF BACKINT in the adapter program configuration file. Use this file to set NetBackup For SAP parameters. For details, see "Configuring the initSID.utl File" on page 47.

Defining a Backup Medium in SAPDB

Prior to running a backup, create at least one backup medium per backup type (complete, incremental) in SAPDB. When using Backint for Oracle, the name of backup medium created must begin with BACK. The type of backup medium must be PIPE.

The following procedure demonstrates connecting to dbmcli, and then creating a backup medium (in this case, a sample medium called BACKORA).

❖ To create a backup medium, run:

```
dbmcli -d MYSAP -u dbm,dbm
dbmcli on MYSAP>medium_put BACKORA \\.\pipe\MYSAP PIPE DATA 0 8
```

Performing a Backup

When running a backup of SAPDB, you must include the backup medium you created. In the previous section, "Defining a Backup Medium in SAPDB" on page 102, the example creates a backup medium called BACKORA. The following backup example uses that sample backup medium.

The first step of the following procedure starts the utility session. You must start the utility session before running a backup.

▼ **To run a backup:**

```
dbmcli on MYSAP>util_connect
dbmcli on MYSAP>backup_start BACKORA DATA (start backup)
```

You can also start the backup using the DBM GUI. For more information about the DBM GUI and configuring external backup tools, refer to the SAPDB documentation at www.sapdb.org.

Index